BIOLOGICAL ASSESSMENT

For

PROPOSED ROADWAY IMPROVEMENTS
ALONG COUNTY STATE AID HIGHWAY 22
(CSAH 22 [MN FH 52])
BELTRAMI COUNTY, MINNESOTA

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1.0 INTRODUCTION

This biological assessment was prepared in conjunction with the Environmental Assessment (EA) for roadway improvements proposed along County State Aid Highway 22 (CSAH 22 [MN FH 22]) in Beltrami County, Minnesota. The biological assessment was prepared as part of the Federal Highway Administration's (FHA) compliance with Section 7(c) of the Endangered Species Act (ESA) of 1973, as amended, and the requirements of the U.S. Forest Service (Forest Service) as defined in Forest Service Manual (FSM) 2600 – Wildlife, Fish And Rare Plant Habitat Management. The biological assessment will be included as an appendix to that EA. The ESA requires that each federal agency, in consultation with and with the assistance of the Secretary (Secretary of the Interior/Secretary of Commerce), ensures that any action it authorizes, funds, or carries out in the United States is not likely to jeopardize the continued existence of any listed species or results in the destruction or adverse modification of critical habitat.

The biological assessment also addresses the threatened and endangered species requirements of the Forest Service as defined in FSM 2600. The biological assessment addresses those requirements by documenting the review of Forest Service programs or activities in sufficient detail to determine how an action or proposed action may affect any threatened, endangered, proposed, or sensitive species. The biological assessment incorporates three primary objectives of the Forest Service to address the potential biological effects of the proposed project on National Forest land. The objectives include:

1. Ensuring that Forest Service actions do not contribute to loss of viability of any native or desired non-native plant, and do not contribute to animal species or trends toward Federal listing of any species
2. Complying with the requirements of the ESA that the actions of Federal agencies do not jeopardize or adversely modify critical habitat of Federally-listed species
3. Providing a process and standard by which to ensure that threatened, endangered, proposed, and sensitive species receive full consideration in the decision-making process.

The biological assessment also was prepared in accordance with guidance outlined in the *Endangered Species Consultation Handbook* issued March 1998 by the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS), and guidelines stated in FSM 2670 (FWS and NMFS 1998; FSM 2001). The handbook defines a biological assessment as "information prepared by, or under the direction of, a federal agency to determine whether a proposed action is likely to: (1) adversely affect listed species or designated critical habitat; (2) jeopardize the continued existence of species that are proposed for listing; or (3) adversely modify proposed critical habitat."

Typically, biological assessments must be prepared for "major construction activities," a term the handbook interprets to include activities that (1) involve construction (such as the building of dams, buildings, pipelines, and roads; the development of a water resource; implementation of channel improvements; and the building of other projects that modify the physical environment);

and (2) constitute major federal actions as recognized under the National Environmental Policy Act (NEPA).

1.1 PURPOSE

The proposed action addressed in the following biological assessment, which is the subject of an EA performed under NEPA, involves construction activities composed of road improvements along 10.8 kilometers (6.71 miles) of CSAH 22, between CSAH 27 and CSAH 39, along the existing rural gravel roadway that passes through the Chippewa National Forest in Beltrami County, Minnesota (Figure 1-1). The biological assessment analyzes the potential effects on state-, federal-, and regional forester-listed threatened and endangered species, proposed species, sensitive species, and designated and proposed critical habitat resulting from the roadway improvements proposed along CSAH 22. The proposed roadway improvements include:

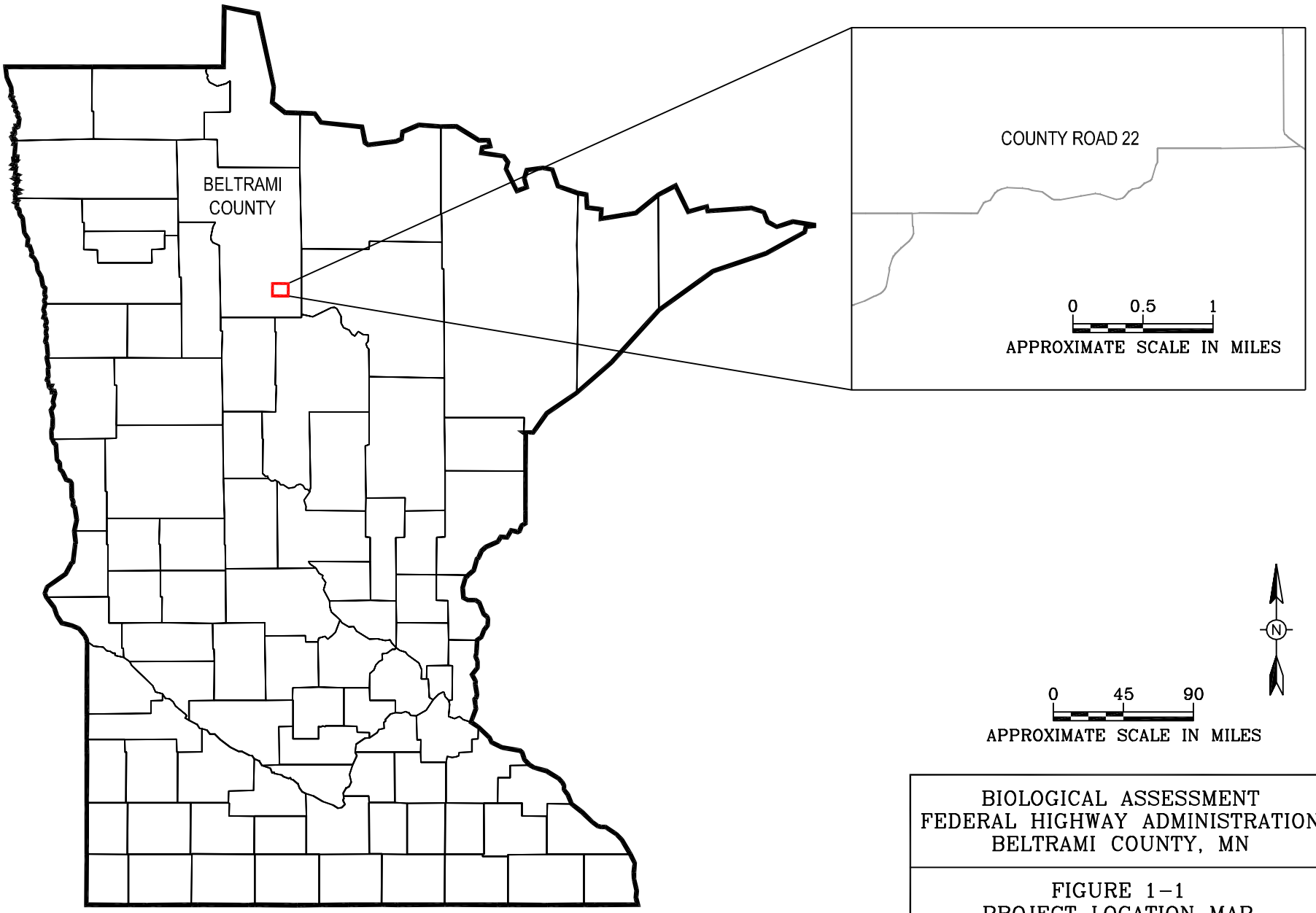
- Initial clearing and widening
- Grading
- Paving
- Installation of road shoulders and drainage swales

The proposed road improvements are needed to improve the riding surface, adjust the roadway's substandard lane width, correct drainage and geometric deficiencies, improve driver safety, and provide for future transportation needs. The project study area for the proposed roadway improvements along CSAH 22 is comprised of a 100-foot corridor or 50 feet (15.24 meters) from the centerline of the existing gravel road or within the limits of construction of the proposed improvements. The project study area was surveyed to determine the existence of state- and federally-listed threatened and endangered species, proposed species, and designated and proposed critical habitat.

1.2 BACKGROUND

The biological assessment addresses threatened, endangered, proposed, and sensitive species as defined by the Minnesota Department of Natural Resources (MDNR), the Forest Service, and the FWS. The federal and state agencies have criteria for listing species, and a variety of management procedures to protect listed species. The following paragraphs briefly describe the listing requirements of each agency.

MDNR has specific requirements for species that are considered threatened, endangered, or of special concern status. MDNR considers a species to be "endangered" if the species is threatened with extinction throughout all or a significant portion of its range within Minnesota. MDNR considers a species to be "threatened" if the species is, within the foreseeable future, likely to become endangered throughout all or a significant portion of its range within



BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 1-1
PROJECT LOCATION MAP

TETRA TECH EM INC.

Minnesota. MDNR considers a species to be a "species of special concern" when the species, although not endangered or threatened, is extremely uncommon in Minnesota, or has unique or highly specific habitat requirements and deserves careful monitoring of its status. Species on the periphery of their range which are not listed as threatened may be included in this category, along with those species that once were once threatened or endangered but now have increasing or protected, stable populations (MDNR 2002).

The Forest Service's Regional Forester Sensitive Species Program, identifies plant and animal species for which viability is a concern, as evidenced by "significant current or predicted downward trends in population numbers or density" or "significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution." (FSM 2670.5-95-7). The program requires the head of each regional office of the Forest Service to develop a list of species with viability concerns and to direct management actions to conserve those plant and animal species. Candidates for sensitive species can come from state lists of endangered, threatened, rare, endemic, unique, or vanishing species and other sources. Each region determines its own list and criteria for listing. Sensitive species are those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, and/or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

There are two means for adding or removing species from the Regional Forester Sensitive Species (RFSS) list. The list of RFSS includes the federally-listed threatened and endangered species that occur within the region, as well as species listed in The Nature Conservancy (TNC) Species Rank. FWS candidate species, species de-listed by the FWS in the last five years, and species with TNC Global, Trinomial, or National Ranks of G1-G3, T1-T3, or N1-N3 will be designated as a RFSS for the National Forests and Grasslands on which they occur. Species listed as a RFSS must have at least one documented occurrence within the proclamation boundary of an Eastern Region National Forest or Grassland and be recognized as a valid species by taxonomic experts. Species can be de-listed as a RFSS when the FWS determines: they are no longer a candidate species, more than 5 years have elapsed since federal de-listing, or a species is removed by TNC from its Global, Trinomial or National Ranks of G1-G3, T1-T3 or N1-N3. Table 1-1 presents the definitions of the national ranking developed by TNC.

TABLE 1-1
DEFINITIONS OF TNC SPECIES RANK

Rank	Definition
G	Global Rank based on populations and occurrences around the globe (wide-range status of a species).
T	Trinomial/subspecies/variety Global Rank (used for subspecies or varieties, these taxa are ranked using the same criteria as G1-G5).
N	National Rank based on populations and occurrences in the United States (including Alaska and Hawaii) (these taxa are ranked using the same criteria as G1-G5).

Rank	Definition
S	State Rank based on the status of a species in an individual state (S ranks may differ between neighboring states based on the relative abundance of a species in each state; these taxa are ranked using the same criteria as G1-G5).
1	Critically imperiled because of extreme rarity (typically less than 6 occurrences or very few remaining acres) or because of some factor that makes the species extremely vulnerable to extinction.
2	Imperiled because of rarity (typically 6 to 20 occurrences, 1,000 to 3,000 individuals, or very few remaining acres) or because of some factor that makes the species extremely vulnerable to extinction throughout its range.
3	Rare or uncommon (typically 21 to 1000 occurrences or 3,000 to 10,000 individuals throughout its range, e.g., a single state or physiographic region) or vulnerable to extinction throughout its range because of specific factors.
4	Widespread, abundance apparently secure globally, although the species may be quite rare in parts of its range, especially the periphery (typically 101^{+} occurrences and 10,000 individuals); however, some cause for long-term concern exists.
5	Demonstrably secure, widespread, and abundant, although the species may be quite rare in parts of its range, especially along the periphery.

The FWS lists a species on the federal Endangered Species List as "threatened" when it is likely to become endangered throughout all or a significant portion of its range in the foreseeable future, and lists a species as "endangered" when it is in danger of extinction throughout all or a significant portion of its range. In addition, the FWS recognizes three categories of candidate species for listing as endangered or threatened:

Category 1 are taxa for which the FWS has substantial information on hand to support the biological appropriateness of proposing to list the species as endangered or threatened. Currently, data are being gathered concerning essential habitat needs, and for some taxa, the precise boundaries for critical habitat designations. Development and publication of proposed listing of these species is anticipated.

Category 2 are taxa for which information now in the possession of the FWS indicates that proposing to list the species as endangered or threatened is possibly appropriate, but for which conclusive data on biological vulnerability and threat(s) are not currently available to support proposed listing.

Category 3 are taxa that are no longer being considered for listing as endangered or threatened and are not regarded as candidate species. There are three subcategories: 3a are taxa for which the FWS has persuasive evidence of extinction; 3b are taxa that although represented in published revisions and monographs do not meet the ESA definition of species on the basis of current taxonomic understanding; and 3c are taxa that have proven to be more abundant or widespread than was previously believed and/or those that are not subject to any identifiable threat.

To define all the species that are required to be addressed in this biological assessment, FHA contacted and obtained information from the FWS, the MDNR, and the Forest Service. Data obtained through consultation with the FWS (Letter, June 14, 2002), the MDNR (Letter, June 12, 2002), and the Forest Service (USFS) (Meeting, June 28, 2002 and letter dated July 29, 2002), indicate that the following state- and federally-listed threatened and endangered species, proposed species, and designated and proposed critical habitat (Table 1-2) may be found in Beltrami County or the Chippewa National Forest. Appendix A contains copies of the consultation correspondence and minutes of consultation meetings held.

TABLE 1-2
STATE- AND FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES WITHIN BELTRAMI COUNTY OR THE CHIPPEWA NATIONAL FOREST

Common Name	Scientific Name	Federal Status	Minnesota Status	Forest Service Status	Suitable Habitat	Habitat
Reptiles						
Common Snapping Turtle	*Chelydra serpentina*	NL	SC	NL	Y	Slow-moving quiet waters with muddy bottoms and dense vegetation; nest is dry sandy uplands
Blanding's Turtle	*Emydoidea blandingii*	NL	T	RFSS	Y	Calm, shallow watered marsh areas with soft bottoms with rich aquatic vegetation and sandy uplands for nesting
Amphibians						
Four-Toed Salamander	*Hemidactylium scutatum*	NL	SC	RFSS	Y	Adults live under objects or among mosses in swamps, boggy streams, and wet, wooded or open areas near ponds or quiet. Larval habitat are mossy or grassy/sedgy pools
Fish						
Greater Redhorse	*Moxostorna valenciennesi*	NL	NL	RFSS	Y	Moderate to fast-flowing, medium-sized to large rivers with sand and gravel substrates
Pugnose Shiner	*Notropis anogenus*	NL	SC	RFSS	Y	Clear, lakes and streams with bottoms of sand and gravel or marl and abundant submerged aquatic vegetation
Insects						
Vertree's Caddisfly	*Ceraclea vertreesi*	NL	SC	RFSS	Y	Medium to large-sized rivers or lakes that are directly connected to a medium or large-sized river
Mussels						
Creek Heelsplitter	*Lasmigona compressa*	NL	SC	RFSS	Y	Creeks and the headwaters of small to medium rivers in fine gravel or sand
Black Sandshell Mussel	*Ligumia recta*	NL	SC	RFSS	Y	Medium to large rivers in riffles or raceways in gravel or firm sand

Common Name	Scientific Name	Federal Status	Minnesota Status	Forest Service Status	Suitable Habitat	Habitat
Fluted-Shell Mussel	*Lasmigona costata*	NL	SC	RFSS	Y	Medium to large rivers in sand, mud or fine gravel in areas with slow to moderate flow
Birds						
Bald Eagle	*Haliaeetus leucocephalus*	T	SC	T	Y	Large trees adjacent to riparian areas with fish
Red-Shouldered Hawk	*Buteo lineatus*	NL	SC	SC	Y	Large tracts of mature, deciduous and mixed riparian forest habitats with a preference for bottomlands and wooded margins near marshes
Piping Plover	*Charadrius melodus*	E/T	E	E	N	Local sandy beaches and sparsely vegetated shores and islands. Migrants only; no known nesting occurrences on the Chippewa NF
Northern Goshawk	*Accipiter gentiles*	NL	NL	RFSS	Y	Large tracts of mature, closed canopy, deciduous, coniferous and mixed forests with an open understory
Leconte's Sparrow	*Ammodramus leconteii*	NL	NL	RFSS	Y	Large sedge-dominated wet meadows
Nelson's Sharp-Tailed Sparrow	*Ammodramus nelsoni*	NL	SC	RFSS	Y	Sedge- or grass-dominated we meadows, marshes, and open peatlands, in large tracts of open habitat
Black Tern	*Chlidonias niger*	NL	NL	RFSS	N	Nests in marshes and wet meadows with a mixture of emergent vegetation and open water
Olive-Sided Flycatcher	*Contopus cooperi*	NL	NL	RFSS	Y	Variety of boreal forests including uplands, lowlands, edges and beaver meadows with a preponderance of standing live or dead large pine, spruce or tamarack trees used for foraging
Yellow Rail	*Coturnicops noveboracensis*	NL	SC	RFSS	Y	Sedge meadows and grassy marshes
Trumpeter Swan	*Cygnus buccinator*	NL	T	RFSS	N	Small ponds and lakes or bays with extensive beds of cattails, bulrushes, sedges, and/or horsetail
Black-Throated Blue Warbler	*Dendroica caerulescens*	NL	NL	RFSS	N	Mature large deciduous trees, especially sugar maple, with a well developed understory of deciduous shrubs in blocks of habitat >1200 acres
Bay-Breasted Warbler	*Dendroica castenea*	NL	NL	RFSS	Y	Mid-age to mature spruce forests infested with spruce budworm and tent caterpillars
Spruce Grouse	*Falcipennis canadensis*	NL	NL	RFSS	Y	Coniferous forest of Jack pine, black spruce and tamarack; habitat always includes short needle component and branches that extend to the ground

Common Name	Scientific Name	Federal Status	Minnesota Status	Forest Service Status	Suitable Habitat	Habitat
Connecticut Warbler	*Oporornis agilis*	NL	NL	RFSS	Y	Mature lowland coniferous habitats especially mature black spruce, tamarack bogs and jack pine barrens with tick shrub understory
Wilson's Phalarope	*Phalaropus tricolor*	NL	T	RFSS	Y	Quiet, shallow pools bordered by wet meadow vegetation
Black-Backed Woodpecker	*Picoides arcticus*	NL	NL	RFSS	Y	Mature coniferous forests which include dead and dying tamarack or spruce bogs, white cedar infested with wood boring beetle larvae
Caspian Tern	*Sterna caspia*	NL	NL	RFSS	N	Islands in very large lakes
Common Tern	*Sterna hirundo*	NL	T	RFSS	N	Isolated, sparsely vegetated islands in large lakes
Great Gray Owl	*Strix nebulosa*	NL	NL	RFSS	Y	Mature lowland black spruce, black ash wetlands, tamarack wetlands and conifer and hardwood uplands adjacent to meadow openings
Sharp-Tailed Grouse	*Tympanuchus phasinellus*	NL	NL	RFSS	N	Expansive areas of graminoid and brush habitat (at least 2 square miles). Habitat niche is between grasslands and forests, usually created and maintained by fire
Mammals						
Canada Lynx	*Lynx canadensis*	E	E	T	Y	Mixed coniferous and deciduous vegetation types; dep snow and abundant snowshoe hares for prey
Gray Wolf*	*Canis lupis*	T	E	T	Y	Broad spectrum of habitats with abundant ungulate prey
Northern Bog Lemming	*Synaptommys borealis*	NL	SC	RFSS	Y	Sphagnum and Labrador tea lowland black spruce/tamarack bogs and peatlands with grasses and sedges in conjunction with an ericaceous shrub layer
Plants						
Blunt-Lobed Grapefern	*Botrychium oneidense*	NL	E	RFSS	Y	Northern hardwoods, especially near ephemeral pools
Pale Moonwort	*Botrychium pallidum*	NL	E	RFSS	Y	Northern hardwoods, odd spots in pine habitat, and openings
Ternate Grapefern, St. Lawrence Grapefern	*Botrychium rugulosum*	NL	T	RFSS	Y	Odd spots, particularly in pine habitat
Least Moonwort	*Botrychium simplex*	NL	SC	RFSS	Y	Northern hardwoods, openings
Fairy Slipper	*Calypso bulbosa*	NL	NL	RFSS	Y	Lowland conifer
Goldie's Wood-Fern	*Dryopteris goldiana*	NL	SC	RFSS	Y	Northern hardwoods and lowland hardwoods within one mile of every large lakes
Olivaceous Spike-Rush	*Eleocharis olivacea*	NL	T	RFSS	Y	Bogs, lakes, streams, and shoreline

Common Name	Scientific Name	Federal Status	Minnesota Status	Forest Service Status	Suitable Habitat	Habitat
Few-Flowered Spike-Rush	*Eleocharis quinqueflora*	NL	SC	RFSS	Y	Bogs, lakes, streams, and shoreline
White Trout-Lily	*Erythronium albidum*	NL	NL	RFSS	N	Northern hardwoods within one mile of very large lakes
Limestone Oak Fern	*Gymnocarpium robertianum*	NL	NL	RFSS	Y	Lowland conifer
One-Flowered Broomrape	*Orobanche uniflora*	NL	SC	RFSS	Y	Northern hardwoods, Lowland conifer, and upland/lowland conifer transition
Small Green Woodland Orchid, Club-Spur Orchid	*Platanthera clavellata*	NL	SC	RFSS	Y	Lowland conifer and bogs
Northern Bur-Reed, Clustered Bur-Reed	*Sparganium glomeratum*	NL	SC	RFSS	Y	Bogs, sedge meadows, wetlands, lakes, streams, and shoreline
American Awlwort	*Subularia aquatica*	NL	T	RFSS	Y	Lakes, streams, and shoreline
Canada Yew	*Taxus Canadensis*	NL	NL	RFSS	Y	Northern hardwoods, lowland hardwoods, lowland conifer
Triangle Moonwort	*Botrychium lanceolatum*	NL	T	RFSS	Y	Northern hardwoods, lowland hardwoods
Goblin Fern	*Botrychium mormo*	NL	SC	RFSS	Y	Northern hardwoods, lowland hardwoods
Matricary Grape Fern	*Botrychium matricariifolium*	NL	NL	NL	Y	Moist to wet coniferous and deciduous woods in the boreal forest ecoregion
Ram's-Head Lady's Slipper	*Cypripedium arietinum*	NL	T	RFSS	Y	Lowland conifer, transition between upland hardwood and lowland conifer
White Adder's-Mouth	*Malaxis monophyllos* or *Malaxis brachypoda*	NL	SC	RFSS	Y	Lowland hardwoods, lowland conifer
Lapland Buttercup	*Ranunculus lapponicus*	NL	SC	NL	Y	Sphagnum hummocks in cool conifer swamps

RFSS Regional Forester Sensitive Species
** All of Beltrami County is critical habitat for the Gray Wolf*

1.3 ORGANIZATION

The biological assessment includes the following: *Section 2.0: Literature Review*, which contains a brief review of the literature discussing the species and where suitable habitat is present within the project study area; *Section 3.0: Observations Made On-Site*, which describes observations made during a site inspection conducted during June 2002; *Section 4.0: Habitat Assessment and Potential Impacts*, which contains an assessment of the potential suitability of habitats in the areas of concern for the subject species and lists conclusions about the potential

impacts of the proposed action on the subject species; and *Section 5.0: Recommendations*, which outlines recommendations for minimizing potential adverse impacts on the subject species and on other biological resources.

2.0 LITERATURE REVIEW

The following literature reviews address the reptiles, amphibians, fish, insects, mussels, birds, mammals, and plants that may occur within the project study area along CSAH 22. No literature review was completed for the species for which no potential habitat was identified within the project study area. The species for which a review was completed included:

2.1 REPTILES

The following subsections contain a description of the reptile species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Common Snapping Turtle - *Chelydra serpentina*

The common snapping turtle (*Chelydra serpentina*) is one of the largest freshwater turtles in North America (Nature Canada 2002) and is the largest turtle in Minnesota (Coffin and Phannmuller 1998). The shell of the snapping turtle can reach a length of 45 centimeters (cm), (17.72 inches) and can weigh up to 15 kilograms (kg) (33.07 pounds). It has a long, serpentine neck, a massive head, muscular legs, and a long tail relative to other North American freshwater turtles. The upper shell of the snapping turtle varies in color from green to brown to black. In young snapping turtles, the shell is characterized by the presence of three longitudinal keels along the carapace (or shell), which gradually disappear as the turtles mature (Coffin and Phannmuller 1998). The posterior margin of the carapace features strong teeth, while the lower shell is considerably reduced. The snapping turtle usually is docile and unobtrusive in water, but is defensive on land, commonly lunging and snapping at perceived threats (Coffin and Phannmuller 1998).

The habitat of the snapping turtle includes freshwater areas throughout the United States east of the Rocky Mountains, from Maine to Montana and south to New Mexico and including all of Minnesota and southeastern Canada. The species prefers slow-moving, quiet waters with muddy bottoms and dense vegetation, such as the lakes, rivers, and marshes of Minnesota. Snapping turtles often congregate in large numbers to overwinter below the ice in muskrat tunnels, streams, and holes in riverbanks by burying themselves in decaying vegetation and mud. They occasionally are seen moving slowly in water beneath ice during the winter. Snapping turtles become active in late April or May (Oldfield and Moriarty 1994).

Snapping turtles are omnivorous and eat a wide variety of foods, including insects, crayfish, clams, snails, earthworms, leeches, freshwater sponges, fish, fish eggs, frogs, tadpoles, amphibian eggs, salamanders, snakes, small turtles, birds, small mammals, carrion, and various types of aquatic plants (Ernst and Barbour 1972). Snapping turtles become sexually mature between the ages of five to seven years and mating occurs during chance encounters any time between April and October. Eggs are laid during June in Minnesota. Adult snapping turtles have few natural predators other than humans and automobiles; however, snapping turtle eggs

are prey for raccoons, skunks, fox, and opossum. Crows, herons, bitterns, bullfrogs, snakes, and large predatory fish commonly eat hatchlings and immature snapping turtles.

The snapping turtle has been assigned special concern status in Minnesota due to harvesting pressures. Significant numbers of snapping turtles are harvested each year in Minnesota for human consumption. During the winter months, commercial turtle hunters locate overwintering congregations by probing through ice with poles and pulling the turtles up with sharp hooks. Harvesting is substantial and unregulated, although licenses are required (Oldfield and Moriarty 1994).

Blanding's Turtle - *Emydoidea blandingii*

According to the Cass County Biological Survey (1998), the Blanding's turtle (*Emydoidea blandingii)* uses emergent marshes, vernal pools, shrub swamps, and fens for feeding, breeding, and overwintering. They use sparsely-vegetated grasslands with sandy soils for nesting. They may travel long distances overland to nesting sites or for dispersal (USFS 2001).

2.2 AMPHIBIANS

The following subsections contain a description of the amphibian species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Four-Toed Salamander - *Hemidactylium scutatum*

The four-toed salamander (*Hemidactylium scutatum*) lives under objects or within mosses in swamps; boggy streams; and wet, wooded or open areas near ponds. Larvae can also be found in quiet, mossy or grassy pools that are without fish. Eggs are laid in sphagnum moss hummocks adjacent to a pool, into which the larvae wriggle after hatching. Adults migrate from wetlands to lowland forests after spring breeding (USFS 2001).

2.3 FISH

The following subsections contain a description of the fish species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Greater Redhorse - *Moxostoma valenciennesi*

Greater redhorse (*Moxostoma valenciennesi)* are inhabitants of medium- to large-sized rivers and, sometimes, lakes. In rivers, it is found in moderate to swift current, in run and riffle habitats with boulder, rubble, and gravel substrates. Spawning has been documented in similar habitats as mentioned above. Most often, greater redhorse spawned in riffles or runs in medium to large

streams with moderate stream velocities (3.8 to 116.9 centimeters per second (cm/s), shallow depths (0.10 to 1.0 cm), and gravel or cobble substrates (USFS 2001).

Pugnose Shiner - *Notropis anogenus*

Pugnose shiner (*Notropis anogenus*) occurs in clear, heavily vegetated glacial lakes and vegetated pools and runs of low gradient creeks and rivers, over bottoms of sand, mud, marl, or gravel. The shiner lives mostly in shallows during the warm months, and probably in deep water during the rest of the year. The pugnose shiner is widely distributed in weedy lakes and streams, but never in abundant numbers. Characteristic vegetation in its habitat includes pondweed species, water milfoil, Elodea, eel grass, coontail, bulrush, Chara, and filamentous algae, especially spirogyra. The elimination of rooted aquatic plants to create swimming beaches has probably contributed to the decline in abundance. Ms. Chantel Cook, fisheries biologist for the Chippewa National Forest, reports that narrow streams (less than 20 feet wide) and lakes not connected to streams are unlikely habitat for the pugnose shiner (USFS 2001).

2.4 INSECTS

The following subsections contain a description of the insect species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Vertree's Caddisfly - *Ceraclea vertreesi*

Little is known about the habitats of the Vertree's caddisfly (*Ceraclea vertreesi*), but it may be found in aquatic habitats ranging from small, headwater streams to larger rivers and lakes with a variety of substrates. There is one known occurrence of Vertree's caddisfly on the Chippewa National Forest. However, surveys have not been conducted to determine the distribution of this species nor have specific threats to this species been identified. However the presence of caddisflies often are used as an indicator of aquatic habitat that have not been degraded by siltation and point and non-point source pollution (USFS 2001).

2.5 MUSSELS

The following subsections contain a description of the mussel species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Creek Heelsplitter Mussel - *Lasmigona compressa*

The creek heelsplitter mussel (*Lasmigona compressa*) is a freshwater mussel characterized by a relatively thin elongated shell, well-developed lateral teeth, a prominent flattened posterior ridge, and a double-looped beak sculpture. The shell is thin, with an outer coloring of yellow, green or brown, often with green rays, and an inner coloring of white to salmon. The outer surface is flat

and smooth without bumps or ridges. The shell, elongated and compressed, has a length of up to 2.54 cm (4 inches). The shell is somewhat longer than wide, with a rectangular shape (National Park Service [NPS] 2001). The anterior end of the shell is broadly rounded, but the posterior end is blunt and squared at the tip. The posterior ridge is prominent and broadly flattened with a small wing behind the umbo, a knoblike protuberance arising from the surface of the shell. The umbo projects slightly above the hinge line. The beak sculpture has five to eight double-looped ridges. The Creek heelsplitter generally has a shallow beak cavity with three pseudocardinal teeth (two in the left valve and one in the right) that are well developed. The lateral teeth (two in the left valve and one in the right) are short, thin, and finely serrated (Illinois Natural History Survey [INHS] 2002).

The creek heelsplitter is widely distributed throughout the United States but is uncommon in much of the Midwest (INHS 2002). The creek heelsplitter mussel is listed by the state of Minnesota as a special concern species. It is found in creeks and the headwaters of small- to medium-sized rivers in fine gravel or sand. It rarely is found in larger rivers (National Park Service [NPS] 2001).

Black Sandshell Mussel – *Ligumia recta*

The black sandshell mussel (*Ligumia recta*) is a freshwater mussel characterized by an elongated shell, pointed posterior end, and smooth surface. The outer coloring of the shell is dark brown to black, with an inner coloring of pink or purple. The outer surface is smooth and shiny. Green rays may be visible on some individuals. The shell, elongated, solid, and moderately compressed can be up to 11.68 cm (4.6 inches) in length for the male and 12.19 cm (4.8 inches) for the female (NPS 2001). The anterior end of the shell is rounded, but the posterior end is pointed in males and saber-shaped in females. The dorsal margin is straight and the ventral margin is straight to curved. The umbo is low, only slightly elevated above the hinge line. The beak sculpture, if visible, is composed of two or three indistinct, double-looped bars. The black sandshell generally has a shallow beak cavity with three pseudocardinal teeth (two in the left valve and one in the right) that are triangular, serrated, and divergent. Occasionally, a small tooth is present on the anterior end. Lateral teeth are long, moderately thin, and straight (INHS 1997).

The black sandshell is widely distributed throughout the United States but is uncommon in much of the Midwest (INHS 1997). The black sandshell is found in medium- to large-sized rivers in riffles or raceways that have formed in gravel or fine sand (NPS 2001).

The black sandshell is listed by the state of Minnesota as a special concern species that is rare and declining. The decline of the black sandshell mussel generally is attributed to the loss or degradation of habitat and a lack of public awareness, as well as inadequate conservation planning or action (FWS 2002a).

Fluted-Shell Mussel - *Lasmigona costata*

Fluted-shell mussel (*Lasmigona costata*) occurs in medium to large rivers, living in sand, mud, or fine gravel in areas with slow to moderate flow. The glochidia larval stage is parasitic on fish. Threats to Midwestern freshwater mussles in general include loss of habitat; siltation; competition from exotic species such as zebra mussel; predation by muskrats and raccoons; and pollution by herbicides, pesticides, and other chemicals (USFS 2001).

2.6 BIRDS

The following subsections contain a description of the bird species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Bald Eagle - *Haliaeetus leucocephalus*

The bald eagle (*Haliaeetus leucocephalus*) is a large raptor. Adult bald eagles typically are 0.91 meters (3 feet) from head to tail, weigh approximately 4.54 to 5.44 kg (10 to 12 pounds), and have a wingspan of as much as 2.13 meters (7 feet). The adult plumage typically consists of a white head, a white tail, and a dark brown body. Adult females generally are similar to but slightly larger than adult males. Juveniles lack the white heads and tails and instead, are dark brown all over. The breeding season begins in the spring (earlier in the southern states), with the young fledging leaving the nest after approximately six months. Most bald eagles in the northern states (including Minnesota) winter southward, but some remain in northern breeding areas year-round (FWS 1983; FWS 1994).

Bald eagles nest almost exclusively at the edges of lakes, rivers, or seacoasts. Their diet consists predominantly of fish, but they also will feed on waterfowl, rodents, snakes, and carrion. They generally nest in tall trees or cliffs near the water's edge, although they occasionally nest on the ground. Bald eagles typically build large nests in trees and often reuse nests in successive years. Bald eagles are highly sensitive to human noise and interference (FWS 1983b; FWS 1995). In Minnesota, they commonly breed on northern lakes and along the St. Croix and Mississippi rivers. Bald eagles move south for the winter to open water areas that attract large numbers of waterfowl or fish. In Minnesota, the open water areas include the Minnesota and Mississippi rivers and lakes in the southern part of the state (University of Minnesota, not dated).

The bald eagle historically had ranged throughout North America, except for extreme northern Alaska and Canada and central and southern Mexico. Populations declined dramatically during most of the 20th century. Many bald eagles had been shot until legislation passed in 1940 prohibited the killing or harassment of the species or disturbing its nests and eggs. Dramatic population declines in the mid-20th century were attributed to the loss of suitable habitat, especially undisturbed forested habitat along the shores of rivers or lakes. Other factors considered to have contributed to population declines include disease, poisoning, and electrocution by overhead electric lines (FWS 1983; FWS 1994).

In 1978, the bald eagle was listed as endangered throughout most of the United States. In subsequent years, bald eagle populations have rebounded significantly, prompting reclassification of the species as threatened in 1995. De-listing from the ESA was proposed in 1999. However, by June 2002, the species remains officially listed as threatened.

Red-Shouldered Hawk - *Buteo lineatus*

The red-shouldered hawk (*Buteo lineatus*) is a large, long-winged raptor, distinguished by its rufous shoulder patches, checkerboard wing pattern, reddish shoulders, and a narrow-banded tail. Short-tailed hawks have either a solid black underbody and wing linings (most common) or nearly solid white ones. Red-shouldered hawks soar with their wings angled forward, with a crescent-shaped translucent window near the tip of the wing visible from below. Young birds are streaked below and are best distinguished from young red-tail hawks by their somewhat smaller size; narrower tail; and longer, narrower wings (American Bird Conservancy 1997). The red-shouldered hawk is fairly numerous in woodlands, especially swamps, although their population seriously is declining throughout the east coast of the United States. The hawks hunt from a perch, typically in roadside areas, building nests of twigs, leaves, lichens, and shredded bark between 20 and 60 feet above ground surface in a tree. They prey on rodents, rabbits, frogs, snakes, turtles, screech owls, robins, crows, wasps, and grasshoppers (National Geographic Society 1965).

Red-shouldered hawks breed in the wet woodlands throughout most of the United States, east of the Rockies and west of the Sierra Nevada Mountain ranges. They are found from Minnesota and New Brunswick south to the Gulf Coast, and on the Pacific Coast from northern California to Baja California. The species winters north, ranging from southern New England to the Ohio Valley. In Minnesota, the population is low and is listed as present, but uncommon (I-bird 2000).

Through June 2002, the red-shouldered hawk has been listed as a Minnesota species of special concern. Throughout much of the Midwest, riparian habitat on the periphery of floodplains largely has been eliminated by various human activities, especially residential and agricultural development. That type of habitat loss has been of particular detriment to the red-shouldered hawk (McKay 1997).

Northern Goshawk - *Accipiter gentilis*

Northern Goshawk (*Accipiter gentilis*) appears to be uncommon in Minnesota and there are concerns about its population status throughout the Lake states. There are approximately 15 known nesting territories in Minnesota; 7 of which are located within the Chippewa National Forest. Habitat preferences are mature deciduous or mixed deciduous and coniferous forests in fairly contiguous blocks intermixed with younger forest and openings for production of prey species. The presence of free water is necessary for optimal habitat. Like other members of the genus *Accipiter*, the goshawk's morphological characteristics for maneuverability in flight (short

rounded wings and long tail) are considered adaptations for foraging beneath the forest canopy, which suggest that this is an important part of this species biology. Goshawks eat mainly rabbits, hares, squirrels, ducks, gallinaceous, and other birds; local diet partly depends on availability. Snags, downed logs, openings, large trees, shrubby understory, and interspersion of vegetation structural stages (grasses to old forests) are critical habitat for prey species used by the goshawk. Goshawk nest sites usually are located in stands with large trees and well developed canopies. Several nest stands may be associated with a single pair of birds. Goshawks may use the same nest in successive years. Disturbance to the nesting pair may result in nest failure and abandonment (USFS 2001).

LeConte's Sparrow - *Ammodramus lecontei*

LeConte's sparrow (*Ammodramus lecontei*) inhabits damp, grass-grown clearings, shallow prairie marshes, tall moist grasslands, sedge marshes often surrounded by bog, and open fens in boreal forests, although it prefers hummocky alkaline wetlands, the sparrow's special habitat requirement appears to be open, moist areas with dense herbaceous vegetation (USFS 2001).

Nelson's Sharp-Tailed Sparrow - *Ammodramus nelson*

Nelson's sharp-tailed sparrow (*Ammodramus nelson*) inhabits freshwater marshes, marshy zones of prairie lakes and pools, wet meadows, sloughs, and alkaline, hummocky fens. Well-drained sections of wetlands with grassy or other herbaceous vegetation appear to be a special habitat requirement (USFS 2001).

Olive-Sided Flycatcher - *Contopus borealis*

The olive-sided flycatcher (*Contopus borealis*) breeds within boreal coniferous and coniferous-deciduous forests, especially in areas with abundant dead trees. The preferred nesting habitats include elevated locations in conifer and deciduous trees, in some areas, on horizontal branches, far from the trunk. The nests are compact and firmly attached with cobwebs and are comprised of twigs, rootlets, lichen, pine needles, which are lined with lichen, grass, and rootlets. The olive-sided flycatcher exclusively feeds on flying insects that can be caught in the air; primarily honey bees.

Yellow Rail - *Coturnicops noveboracensis*

The yellow rail (*Coturnicops noveboracensis*) inhabits shallow, freshwater, grassy and sedge marshes, and wet meadows. The rail prefers drier portions of a marsh, where the ground is damp but in which there is not any standing water (USFS 2001).

Bay-Breasted Warbler – *Dendrocia caerulescens*

The bay-breasted warbler (*Dendrocia caerulescens*) breeds in open spruce forests, and is found in deciduous trees during migration. The nest is made up of dried grass stalks, mosses, roots,

twigs, and lichens, and is lined with bark strips and hairs of rabbit. The nest can be found anywhere from 10 to 50 feet above ground in a spruce, birch, or hemlock tree and sometimes even in shrubs. The warbler normally roost in places where they nest. The presence of bay-breasted warblers is highly associated with outbreaks of spruce budworm in mature spruce-fir, and is dependent on the budworm to rear nestlings. During the months of May through July, approximately 4 to 6 eggs are laid; incubation is by the female only and lasts approximately 12 days (USFS 2001).

Spruce Grouse - *Falcipennis Canadensis*

Spruce grouse (*Falcipennis Canadensis*) habitat is northern coniferous forests of various species compositions, but always includes short-needled trees. Forest types inhabited by spruce grouse in Minnesota range from boreal forest and wet spruce forests in the far north to jack pine/spruce, jack pine, or spruce/fir associations in the southern portions of the range. One regular component of spruce grouse habitat everywhere is inclusion of areas with an understory of low berries, especially *Vaccinium* spp., which is an important food source, and apparently is the key feature structure that provides good cover for ground nesting birds. Jack pine forests must be young enough that they have not begun to self-prune. Populations of these birds may be highest in forests in the earlier stages of post-fire succession. Older pine forests are used by the grouse when subdominant spruces are present. Mature fir stands also will self-prune and become unsuitable (USFS 2001).

Connecticut Warbler - *Oporornis agilis*

The Nature Conservancy Species Status Sheet (2000) for the Connecticut warbler (*Oporornis agilis*) reports that the species breeds in spruce and tamarack bogs, dry ridges, aspen woods, moist areas with low shrubby growth, thick undergrowth, or sapling thickets. They occur in thickets of low wet woods or wet meadows during migration. Non-breeding habitat includes woodland, forest borders, and shrubby clearings. Apparently breeding habitat for this species in Minnesota is limited to mature black spruce or tamarack bogs and jack pine barrens with a thick shrub understory.

Wilson's Phalarope – *Phalaropus tricolor*

Wilson's Phalaropes (*Phalaropus tricolor*) use both fresh and alkali wetlands that possess three characteristics: open water, emergent vegetation, and open shoreline. Nesting habitat varies widely, including wetlands, wet meadows, upland grasslands, and road rights-of-way. Nest site selection varies seasonally; Wilson's Phalaropes nest in upland vegetation early in the breeding season and wet-meadow vegetation later in the season. They usually nest within 100 meters of the shoreline. They also exhibit annual variation in nest site selection, moving to deeper, more permanent wetlands in dry years (USFS 2001).

Black-Backed Woodpecker – *Picoides articus*

The black-backed woodpecker (*Picoides articus*) usually inhabits high elevation spruce/fir forest, especially those with windfalls, burned areas, and many standing dead trees. The black-backed woodpecker also can be found in swamps and mixed deciduous/coniferous forests usually above 3,000 feet. In the winter, this bird will wander into lower elevation coniferous forests. The black-backed woodpecker feeds almost exclusively on the larvae of wood-boring beetles and may consume over 13,000 annually. The bird seems predisposed to forage in burned areas and its black back may serve as a form of camouflage when feeding in these denuded areas. The breeding biology of this woodpecker is not well known although it seems to prefer fir trees with a cavity below a branch. Nest cavities are generally constructed each year as a means to control parasites and avoid nest predators (USFS 2001).

Great Gray Owl - *Strix nebulosa*

According to the Nature Conservancy Species Status Report, the great gray owl (*Strix nebulosa*) occurs in dense coniferous and hardwood forest, especially pine, spruce, paper birch, and poplar; as well as second growth forest, especially near water. The owl forages in wet meadows, boreal forest, and spruce/tamarack bogs in the far north, and coniferous forest and meadows in mountain areas. Preferred foraging sites for the owl are in an open area where scattered trees or forest margin provide suitable sites for visual searching. Pocket gophers and voles dominate the diet of the North America great gray owl. The owls nest in the top of large broken-off tree trunks (especially in south), in old nests of other large birds (for example, a hawk's nest), and in debris platforms of dwarf mistletoe. Nests frequently are located near bogs or clearings. An owl pair often nests in the same area in successive years, and nests are frequently reused (USFS 2001).

2.7 MAMMALS

The following subsections contain a description of the mammal species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Canada Lynx - *Lynx canadensis*

The Canada lynx (*Lynx canadensis*) is a large North American cat physically distinguished by a short, black-tipped tail, tufted ears, and extremely large feet that enable it to walk easily through deep snow (Burt and Grossenheider 1980). The Canada lynx resembles the bobcat, which has a tail that only is tipped in black at the top (Burt and Grossenheider 1980). The total body length of the Canada lynx ranges from 81 to 91 cm (31.89 to 35.83 inches) and body weight ranges from 6.7 to 13.5 kg (14.77 to 29.76 pounds). The tail is only about 10 cm (3.94 inches) in length.

The Canada lynx prefers habitat in mature, older forests with downed trees and windfalls that provide cover for denning sites, escape, and protection from severe weather (FWS 2002b). The Canada lynx is a predominantly solitary animal that dens in hollow logs, beneath large tree roots, and in other sheltered areas (Sutton and Sutton 1985). The Canada lynx occupies swamps and forested areas across northern North America, including Alaska, Canada, and the northern United States, including Washington, Oregon, Idaho, Wyoming, Montana, Minnesota, Wisconsin, and the Upper Peninsula of Michigan. The Canada lynx also is found in the alpine forests of Utah and Colorado. The Canada lynx occurs predominantly on Federal lands, especially in the West.

Canada lynx populations fluctuate widely based on climate and the availability of prey, with peaks every nine to ten years. The Canada lynx are highly specialized to hunt snowshoe hares, their primary prey. The Canada lynx is a nocturnal hunter, feeding primarily on snowshoe hares, rodents, and birds. The breeding season of the Canada lynx is during January and February, with a three-month gestation period. Kittens remain with the mother for the first winter. Individual Canada lynx range up to 80 kilometers (km) (49.71 miles) or more, with breeding ranges up to 8 km (4.97 miles) (Burt and Grossenheider 1980).

In 2000, the Canada lynx was listed as a threatened species in the contiguous United States under the ESA, including a special regulation that allows for the take and export of lawfully obtained captive-bred lynx. The FWS concluded that the threat to the Canada lynx in the contiguous United States is the lack of guidance to conserve the species in current Federal land management plans. The agency is working with other Federal agencies to conserve Canada lynx habitat. The USFS has signed a Lynx Conservation Agreement, which would affect all forest plans within lynx habitat, that states, “Lynx habitat in the Great Lakes Geographical Area is embedded within the ecotone between boreal and mixed deciduous forests. In the Great Lakes states, lynx habitat consists of boreal spruce-fir forests, aspen, pine and mixtures of upland conifer and hardwood, interspersed with lowland conifer and shrub swamps and bogs, in those areas where snow accumulation and condition may limit travel of competing species. ”Additionally, the Bureau of Land Management and the NPS also are developing lynx conservation agreements (FWS 2000).

Gray Wolf - *Canis lupus*

The gray wolf (*Canis lupus*) is the largest wild dog in North America (Burt and Grossenheider 1980). The gray wolf resembles the coyote. The color of the gray wolf’s fur varies from nearly white in the Artic to nearly black, but typically is medium gray (Burt and Grossenheider 1980). Its total body length ranges from 100 to 205 cm (3.28 to 6.68 feet) and its body weight ranges from 31.5 to 54 kg (69.45 to 119.05 pounds) with males generally larger than females. Standing height at the shoulders is 66 to 71 cm (25.98 to 27.95 inches) (Burt and Grossenheider 1980).

The habitat of gray wolves ranges from open tundra to forests. Prior to 1900, the gray wolf occupied most of the North American continent; however, the species currently is found only in Alaska, Canada, Yellowstone National Park in Wyoming, and northern portions of states along the northern United States border, including Minnesota and Montana.

The gray wolf is a social animal, mating for life and living in packs of 2 to 15 individuals. The strongest male typically leads the pack, although all members of the pack help care for the young. Both parents bring food to the young (Burt and Grossenheider 1980). The gray wolf hunts at night, feeding primarily on large mammals such as caribou, moose, and deer, although it will eat generally whatever is available, including birds. Gray wolves tend to hunt in packs of up to 12 individuals during the nonbreeding season, with hunting areas as large as 96 km (59.65 miles) in diameter for a single pack (Burt and Grossenheider 1980).

Gray wolves are listed under the ESA as a threatened species in Minnesota and as an endangered species elsewhere in the 48 contiguous states. In Alaska, wolf populations number 5,900 to 7,200 and are not considered threatened or endangered. Wolves became nearly extinct in the lower 48 states in the early part of the 20th century because settlers believed wolves caused widespread livestock losses. Constantly persecuted and targeted by large-scale predator eradication programs sponsored by the Federal government, wolves have been pursued with more passion and determination than any other animal in United States history. By the time wolves were finally protected by the ESA, they had been exterminated from the lower 48 states, except for a few hundred that had inhabited the extreme northeastern Minnesota (FWS 1998).

Gray wolf recovery under the ESA had been so successful that in June 1998, FWS announced that it would review the species' status and consider delisting or reclassifying specific wolf populations where appropriate. Successful reintroduction and management programs have greatly accelerated gray wolf recovery in the Rocky Mountains. Gray wolves have expanded greatly their numbers thanks to science-based wolf and wolf habitat management; restoration of wolf prey species such as deer, elk, and moose; and habitat and legal protection. In Minnesota, where the largest wolf population in the 48 contiguous states resides, a state program provides compensation for livestock confirmed to be killed by wolves, and a Federal program provides for the trapping of individual wolves guilty of depredation. In other areas of the US, a private compensation program run by Defenders of Wildlife, an organization that supports wolf restoration pays for livestock killed by wolves (FWS 1998).

Northern Bog Lemming – *Synaptommys borealis*

The Northern bog lemming (*Synaptomis borealis*) ranges from southern Alaska across central Canada to Labrador, with a southern range limit that extends into northern Minnesota. Three occurrences of this species have been documented in Minnesota along the Minnesota/Canada border (Coffin and Pfannmuller 1988). Minnesota state records of *S. borealis* suggest that the species is never common, with small breeding populations living in isolated groups.

Northern bog lemmings primarily live in burrows among sedges and grasses where moisture levels are high and growth of sedges and grasses are sufficient to provide cover as well as act as their food supply (Wilson et al, 1999). During the snow-free months this species is active both above and below ground, although most activity at this time occurs below ground to avoid predation by mammalian and avian predators (Wilson et al, 1999). During the winter months,

the risk of predation is lowered and most activity occurs above ground. Lemmings construct globular nests composed of mosses, grasses, and sedges at ground level just beneath the snow in the winter months and build their nests underground in the summer months (Banfield, 1974). They remain active year-round.

Foraging activities are largely confined to runway systems where vegetation is harvested and either consumed or removed to underground nests via excavated burrow systems (Wilson et al, 1999). Northern bog lemmings primarily frequent sphagnum-Labrador tea-black bogs but they also are found to live among deep, moist spruce woods, wet, sub-alpine meadows, and alpine tundra (Mead et al, 1992).

2.8 PLANTS

The following subsections contain a description of the plant species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Triangle Moonwort - *Botrychium lanceolatum*

Triangle moonwort, or lance-leaved moonwort (*Botrychium lanceolatum),* is in the *Ophioglossaceae* or moonwort family. The plant stems produce one frond per season, bearing main roots 0.5 to 1 millimeter (mm) in diameter. The stipes are 3 to 14 cm (1.18 to 5.51 inches) long, with the fertile portion of the laminae 1.5 to 8.0 cm (0.59 to 3.15 inches) long and the sterile portion 1 to 6 cm (0.39 to 2.36 inches) long. The laminae are obtuse at the base, acute or round at the apex, and typically 1 to 6.5 cm (0.39 to 2.56 inches) wide. The laminae rarely is lobed or pinnatifid, and its margins are entire.

Triangle moonwort is listed by the state of Minnesota as a threatened species. This species was first colleted in Minnesota in 1918 in Morrison County. Until it was collected again in 1991, its status had been a mystery. Several years have provided a clearer idea of its distribution and preferences for northern hardwood habitats (MDNR 1995). Triangle moonwort has been identified from 19 locations within the Chippewa National Forest (USFS 2002).

Blunt-Lobed Grapefern - *Botrychium oneidense*

Blunt-lobed grapefern (*Botrychium oneidense*) appear to prefer moist depressions in hardwood forests in the central part of the state. Four years of surveys by MDNR in potentially suitable habitat resulted in only five new colonies discovered, none of which occurs on a protected site. Wagner and Wagner (1993) describe the range wide habitat as “Moist, shady, acidic woods and swamps.” *Botrychium oneidense* is known from only a single location on the Chippewa National Forest, where it was reported found in a moist ephemeral pool in a northern hardwood stand (USFS 2001).

Pale Moonwort - *Botrychium pallidum*

The Minnesota County Biological Survey (1998) gives the following account for pale moonwort (*Botrychium pallidum):* "This species was first discovered in Minnesota by Lynden Gerdes in the Superior National Forest in 1992, where it was growing in full sun on sandy soil. Subsequent collections from Lake, Itasca, Cass, and Aitkin counties have been from diverse habitats, including deciduous forests near lakes or streams and conifer forests on sandy soil. Rangewide, this species occurs sporadically in both shaded areas and open fields." There currently are 11 known locations of the plant on the Chippewa National Forest. Chippewa National Forest habitats include unspecified hardwood forest (2 collections), hardwoods near lakeshore (5 collections), a depression in a housing development (1 collection), an open field (1 collection), and a red pine plantation near a lakeshore (2 collections) (USFS 2001).

Ternate grapefern, St. Lawrence grapefern - *Botrychium rugulosum*

The Cass County Biological Survey (1998) gives the following account for ternate grapefern (*Botrychium rugulosum):* "Within its range in Minnesota, this plant has been collected in various habitats, including a Jack Pine Forest, a Red Pine plantation, an opening adjacent to a White Pine plantation, a brushy field and a mesic deciduous forest. This species now appears very rare in northern Minnesota and apparently throughout its range. Its habitat requirements are still not thoroughly understood, but most of the twelve known locations are either in pine forests or in forested wetland margins." Currently, there are six known locations of this species on the Chippewa National Forest. Five collections were taken from mossy or moist areas in or by pine stands, while a sixth was found at the edge of a low area in a deciduous forest (USFS 2001).

Least Moonwort - *Botrychium simplex*

The Minnesota County Biological Survey (1998) gives the following account for least moonwort (*Botrychium simplex)*: "This is probably the smallest fern found in Minnesota and is one of the least understood. Based on the information at hand, this appears to be a very rare species in Minnesota that can be found in both hardwood forests and prairies and is possibly dependent on a specialized microhabitat." There are four known locations of the species on the Chippewa National Forest. Collections were taken from a depression in an open area dominated by reed canary grass, an open field with non-native grasses, and two northern hardwood stands (USFS 2001).

Fairy Slipper - *Calypso bulbosa*

Fairy slipper (*Calypso bulbosa)* was added to the Eastern Region Regional Forester Sensitive list in February 2000. The University of Minnesota herbarium has 16 records of this species from the Chippewa National Forest, all of which are reported to be found in conifer or white cedar swamps. The plant typically is found on a substrate of coarse woody humus rather than saturated peat or deep Sphagnum and, to a lesser extent, in upland coniferous forests, especially in needle duff under pines. Chadde (1999) describes the habitat as "Hummocks in northern white cedar

swamps; moist to wet conifer forests; boreal forests; and moist, mixed forests of conifers (such as balsam fir and white spruce), and deciduous trees (such as paper birch); often in moss (though not usually in sphagnum moss), and usually where shaded; soils rich in woody hummus. *Calypso bulbosa* is also found on drier, often calcareous sites near the shores of the Great Lakes, where the plant occurs in the leaf litter under northern white cedar and balsam fir" (USFS 2001).

Limestone Oak Fern - *Gymnocarpium robertianum*

All references state that limestone oak fern (*Gymnocarpium robertianum)* may be found on calcareous cliffs, of which there are none on the Chippewa. Off of rock, the species occasionally is found in various habitats. Pryer (1993) reports "Thuja swamps", Tyron (1980) says "coniferous woods", while Lellinger (1985) says "wooded slopes." Specimens in the University of Minnesota Bell herbarium collected in northern Minnesota mostly had come from cedar swamps, and others from spruce/fir habitat. The species is uncommon in Minnesota (13 documented occurrences). There are two known locations on the Chippewa National Forest, both from a cedar swamp in the Pennington Bog Scientific Natural Area (USFS 2001).

Goldie's Woodfern - *Dryopteris goldiana*

Goldie's woodfern *(Dryopteris goldiana)* generally occurs in moist soil on north- and east-facing wooded slopes in southeastern Minnesota. However, five disjunct populations were documented in North-Central Minnesota, north of Leech Lake in Cass County between 1975 and 1992, and one population was recorded in the Chippewa National Forest in Itasca County in 1999. All of the northern populations occur in association with closed canopy maple/basswood forest.

Olivaceous Spike-Rush - *Eleocharis olivacea*

Olivaceous spike-rush *(Eleocharis olivacea)* is known to occur within a variety of wetland and aquatic habitats within northern Minnesota, including floating sedge mats, lake beaches, and river margins. Three populations have been documented in Minnesota (all from north central Minnesota). Although many suitable palustrine, riverine, and lacustrine wetland habitats were surveyed along the proposed corridor for this species, no populations were found during the June 2002 surveys.

Few Flowered Spike Rush - *Eleocharis pauciflora*

Few flowered spike rush (*Eleocharis pauciflora)* is known to occur within a variety of wetland and aquatic habitats within Northern Minnesota, including floating sedge mats, lake beaches, and river margins. It is known to occur within the Chippewa National Forest, and was last documented there in 1925 on the beach of Ball Club Lake in Cass County. Although many suitable palustrine, riverine, and lacustrine wetland habitats were surveyed along the proposed corridor for this species, no populations were found during the June 2002 surveys.

One-Flowered Broomrape - *Orobanche uniflora*

The single known occurrence of one-flowered broomrape (*Orobanche uniflora)* on the Chippewa National Forest is a northern disjunct from the species range, which in Minnesota is otherwise restricted to the southeast section of the state. The Chippewa population is in a transition zone between a white cedar swamp and a northern hardwood forest, and was discovered by Steve and Carol Mortensen on June 18, 1997. Elsewhere in the Lake States, the species occurs in moist woods, streambanks, along edges of conifer thickets adjacent to dunes, and in sandy open areas. *Orobanche uniflora* is parasitic on many plant species, including *Aster* and *Soildago* in Minnesota (USFS 2001).

Small Green Woodland Orchid, Club Spur Orchid - *Platanthera clavellata*

Small green woodland orchid *(Platanthera clavellata)* is known from only a single collection on the Chippewa National Forest. Smith (1993) reports the Minnesota habitat as "Mostly in boreal-type sphagnum swamps and floating mats; usually associated with scattered, often stunted black spruce or tamarack. There also is a record from an acid peaty meadow on the Anoka sandplain." The records from southern Minnesota are from wet, peaty meadows, but the records from northern Minnesota are from conifer swamps (Coffin & Pfannmuller, 1988). The collection from the Chippewa National Forest is from a mixed conifer swamp.

Northern Bur-Reed, Clustered Bur-Reed - *Sparganium glomeratum*

The Cass County Biological Survey (1998) gives the following account for northern bur-reed (*Sparganium glomeratum):* "In general, Clustered Bur-reed inhabits areas characterized by gradually fluctuating water levels. These habitats include ditches, wetlands influenced by beaver activity, detached floating mats of marsh vegetation and moat-like areas of open water that encircle wetlands." There are 14 known locations of *Sparganium glomeratum* on the Chippewa National Forest (USFS 2001).

American Awlwort – *Subularia aquatica*

Although it is widely distributed throughout much of North America, American awlwort (*Subularia aquatica*) is uncommon or locally rare though most of its range. The first record of this species in Minnesota was documented in 1944 at Poplar Lake in Cook County. Since then, approximately 15 locations have been documented. In 1996, the State of Minnesota changed the protected status of *Subularia aquatica* from "endangered" to "threatened," due to several recent discoveries of previously unknown populations in the Border Lake region of the state. The majority of the known Minnesota populations occur primarily within shallow lake margins of the Border Lake region, along the Minnesota/Canada border. However, a few populations have been documented elsewhere in the state, as far south and west as Caribou Lake in the Chippewa National Forest in Itasca County. For the most part, all Minnesota populations are somewhat isolated and sporadic in their geographic distribution. This species tends to persist in relatively large natural areas and wilderness areas, where hydrologic modifications to lake levels and water

chemistry are less likely to occur due to the relative absence of human development and disturbance (Coffin & Pfannmuller, 1988).

Canada Yew - *Taxus canadensis*

Canada yew (*Taxus canadensis*) was added to the Eastern Region RFSS list for the Chippewa National Forest in February 2000. Hils (1993) gives the rangewide habitat for Canada yew as "Understory shrub in rich forests (deciduous, mixed, or coniferous), bogs, swamps, gorges, ravine slopes, and rocky banks." Canada yew is rare on the Chippewa (13 known collections) but yet is found in several different upland and lowland habitats. University of Minnesota herbarium specimens from the Chippewa were collected in cedar swamp, northern hardwoods, mixed conifer swamp, and lowland hardwood communities. Five relevé plots in the Chippewa National Forest contain Canada yew. They occur in moist sugar maple/basswood, lowland hardwood communities, and white cedar communities. Foster (1993) reports that yew does not occur in early or mid-seral communities. Schmoller (1999) reports that Canada yew is shade tolerant and will be impacted by an opening of the surrounding forest canopy. In addition, the viability of many populations may be threatened by over-browsing by white-tailed deer (USFS 2001).

Goblin Fern - *Botrychium mormo*

The goblin fern (*Botrychium mormo*) is a member of the moonwort family (*Ophioglossaceae*). The plant stems produce one frond per season, with stipes 4 to 5 cm (1.57 to 1.97 inches) long. The fertile portion of the laminae is linear, 2.4 to 7.5 cm (0.94 to 3 inches) in length, and the sterile portion of the laminae is 1.3 to 4.1 cm (0.51 to 1.61 inches) in length. The goblin fern is the smallest North American moonwort known. Its small size makes it difficult to detect, and may account for the sparse collection records within its range. Further, there is some evidence that this species may not put forth above-ground growth in dry seasons.

The historical range of the goblin fern is very limited. It currently is known only in Minnesota, Wisconsin, and Michigan. Even within this range, the plant apparently is very rare. The Minnesota records are from a single habitat type in the general vicinity of Itasca State Park in Clearwater County. The concentration of records in that area probably is due to the proximity of research facilities at the Itasca Biological Station. Expanded searches may find populations scattered throughout northern Minnesota. The fern's habitat appears to be mesic, deciduous forest of *Tilia americana* (basswood) and *Acer saccharum* (sugar maple) (Coffin 1988). Goblin fern is listed by the state of Minnesota as a species of special concern.

Matricary Grape Fern - *Botrychium matricariifolium*

The Matricary grape fern (*Botrychium matricariifolium*) is a member of the moonwort family (*Ophioglossaceae*). Like many of the *Ophioglossaceae*, the plant stems of the Matricary grape fern produce one frond per season. Its main roots range from 0.5 to 1.0 cm (0.2 to 0.39 inches) in diameter. The stipes of the grape fern are 3 to19 cm (1.18 to 7.48 inches) long, the fertile

portion of the laminae is 3 to 12 cm (1.18 to 4.72 inches) long, and the sterile portion is 1.5 to 11 cm (0.59 to 4.33 inches) long. The laminae typically are 0.8 to 4 cm (0.2 to 1.57 inches) wide, and are obtuse to truncate at the base and acute to round at the tip. The margins of the laminae are entire.

The Matricary grape fern has been collected throughout central and northern Minnesota, within the prairie, northern hardwood, and boreal forest eco-regions. It most commonly occurs within moist to wet coniferous and deciduous woods in the boreal forest eco-region of northeastern Minnesota. Hybrids of this species, along with *Botrychium simplex,* have been reported in central Michigan.

The Matricary grape fern is not listed as endangered, threatened, or special concern in Minnesota. However, the Minnesota Natural Heritage Program tracks historic records and newly discovered populations of the fern. The species may be considered for future inclusion on Minnesota's rare plant lists, pending research and field investigations into the species' statewide distribution.

Ram's-Head Lady's Slipper - *Cypripedium arietinum*

Ram's-head lady's slipper (*Cypripedium arietinum*) is a member of the *Orchidaceae* or Orchid family. Like all members of the genus *Cypripedium*, *C. arietinum* has three petals, one modified into a pouch or "slipper." In *C. arietinum*, the pouch is densely pubescent and white with purple markings, and has two or more alternate leaves borne nearly to the top of the stem. The lateral sepals are free rather than fused, which distinguishes *C. arietinum* from all other *Cypripediums* (Coffin 1988).

The Minnesota populations of the Rams-head lady's slipper occur in a variety of coniferous forest habitats. Several of those habitats occur in bogs dominated by *Thuja occidentalis* (northern white cedar), *Larix laricina* (tamarack), or *Picea mariana* (black spruce). The species occurs more commonly in upland conifer forests that may be dominated by *Pinus strobes* (white pine), *Pinus resinosa* (red pine), or *Pinus banksiana* (jack pine). In white pine-dominated areas, the plant may be found in loamy or clayey soil, or even sand (Coffin 1988). All those habitats appear to be weakly acidic or circumneutral, several of which are mineral-rich while others are mineral-poor. The wide range of habitats occupied by the species makes it difficult to specify which factors limit its occurrence and why it is so rare (Coffin 1988). Known flowering dates range from May 20 to June 26 in Minnesota (Smith 1993).

Ram's-head lady's slipper currently is listed by the state of Minnesota as a threatened species. Since the 1850s, the species always has been considered uncommon in Minnesota and its geographical range in the state appears to have been reduced during the 1900s. Populations in Hennepin and Wright counties have not been verified since 1911 and 1927 respectively, and are believed to have been destroyed by residential development. Recent intensive surveys of potential habitat in the northern Twin Cities metropolitan area have failed to document any extant populations south of Aitkin County. When the Ram's-head lady's slipper was designated

as endangered in 1984, it had been found in fewer than 20 locations. Today, there are more than 50 known sites in a variety of forested habitats (MDNR 1995).

White Adder's-Mouth - *Malaxis monophyllos*

White adder's-mouth (*Malaxis monophyllos*) is a member of the orchid family (*Orchidaceae*). The single stem of *M. monophyllos* typically is 11 to 22 cm (4.33 to 8.66 inches) long with one leaf per stem that arises from a globular pseudobulb with few fibrous roots. The base of the stem is strongly sheathed. The single leaf blade rarely is basal, is ovate-elliptical, 2.7 to 8.0 cm (1.06 to 3.15 inches) long, and 1.3 to 3.7 cm (0.51 to 1.46 inches) wide. The inflorescence is a terminal raceme, forming a relatively long slender spike 4.0 to 11.5 cm (1.57 to 4.53 inches) long and 0.4 to 0.9 cm (0.16 to 0.35 inches) wide. The single inflorescence consists of 14 to 34 minute greenish white flowers. Floral bracts are lanceolata 1.0 to 2.0 mm long with pedicles 2.0 to 3.0 mm long, the upper and lower ones nearly equal in length. Known flowering dates range from June 20 to July 29 in Minnesota (Smith 1993).

White adder's-mouth is listed by the state of Minnesota as a species of special concern. This is one of the most rare native orchids that occur in Minnesota. It inhabits conifer swamps in the northern half of the state. Recently, intensive surveys of suitable habitat within the heart of its range discovered only 18 small, widely scattered colonies in six counties (Pine, Cass, Clearwater, Itasca, Roseau, and Lake of the Woods). A historic population decline cannot be documented from the available data, but the orchid is vulnerable to wetland drainage, logging, and land conversion (MDNR 1995).

Lapland Buttercup - *Ranunculus lapponicus*

Lapland buttercup (*Ranunculus lapponicus*) is in the Buttercup family (*Ranunculaceae*). The rhizomes of the plant elongate, bearing at each node a solitary stem. The typical stand of lapland buttercup is 10 to 20 cm (3.94 to 7.88 inches) tall and has 1 to 2 basal leaves (Gleason 1991). Lapland buttercup seems to prefer *Sphagnum* hummocks in cool conifer swamps. It reproduces by long rhizomes and can form large colonies under favorable conditions (Coffin 1988).

Lapland buttercup is listed by the state of Minnesota as a species of special concern. It is distributed across the arctic and boreal regions of Alaska, Canada, Greenland, and Europe. The plant is very rare south of the Canadian border, and most of the recorded locations in the United States are in Minnesota. Recently, there have been several records elsewhere in the state, but surprisingly, none had been recorded during MDNR's recent inventory of 18 ecologically significant peatlands. However, much of the potential habitat still remains to be investigated, and new populations likely will be found in the future (Coffin 1988).

3.0 OBSERVATIONS MADE ON SITE

Two biologists from Tetra Tech EM Inc. (Tetra Tech) conducted a pedestrian survey from June 27 to June 29, 2002, along the section of the proposed roadway improvement of CSAH 22. The inspectors walked the 10.8-kilometer (6.71 mile) section of CSAH 22, between CSAH 27 and CSAH 39, conducting habitat assessments and sensitive species surveys within 15.24 meters (50 feet) of the centerline of the existing gravel road or within the limits of construction of the proposed improvements (project study area). Figure 3-1, Survey Area and Basemap Sections of CSAH 22, illustrates the locations of the 23 basemaps that were used to identify and record the habitat assessments and sensitive species surveys. Figures 3-2 through 3-11 present the individual basemaps where sensitive habitats or species were identified. Figures 3-1 to 3-11 are located at the end of Section 3.0.

The centerline and the limits of construction of the proposed roadway improvements deviated from the existing roadway centerline in three locations along CSAH 22. In those instances, the proposed survey limits were measured in the field using survey basemaps and were included in the project study area; habitat assessments and sensitive species surveys were conducted in areas of predominantly natural and semi-natural vegetation. Figures 3-4 through 3-8, 3-10, and 3-11 illustrate those basemaps.

As shown in Figure 3-1, no basemaps were available for a section of the survey area that previously had been widened and re-graded. For that section, a habitat assessment and sensitive species survey was completed for areas falling within 15.24 meters (50 feet) of the centerline of the existing gravel road. The edges of the previously improved roadway consisted primarily of non-native grasses and early successional shrubland and aspen (see Appendix B, Photos 3 and 5).

Only one of the species listed in Table 1-2 was observed during the June assessment. One mature female snapping turtle (*Chelydra serpentina*) was found dead within a roadside swale on the western end of the survey area (see Figure 3-3 and Appendix B, Photo 4). The snapping turtle appeared to have been struck by a motor vehicle while crossing the road, most likely in search of a suitable upland nesting site. The turtle's carapace (shell) measured 25.4 centimeters (cm) (13 inches) in length and 27.94 cm (11 inches) in width, and 60.96 cm (24 inches) from the head to tail (see Appendix B, Photo 4).

A species of buttercup, the small yellow water crowfoot (*Ranunculus gmelini)* was observed in four locations along the proposed right-of-way (see Figures 3-6 and 3-11). The species was found growing in saturated to inundated mossy depressions located in northern white cedar swamps within 9.14 meters (30 feet) of the edge of the existing road (see Appendix B, Photo 8). *R. gmelini* is not a state- or federally-listed threatened, endangered, or special concern species, but is tracked by the Minnesota Natural Heritage Program for future consideration for inclusion on the rare species lists. A reference collection of the buttercup was made along with notes on habitat and associated species, and was submitted to the Minnesota Natural Heritage Program and the University of Minnesota Herbarium for inclusion in their collection and database.

Summarized in Section 3.1 are descriptions of habitats and other site observations for the proposed expansion of the right-of-way. Wildlife observations are summarized in Table 3-1.

TABLE 3-1
WILDLIFE OBSERVED DURING SITE VISIT (JUNE 2002)
BIOLOGICAL ASSESSMENT FOR PROPOSED ROADWAY IMPROVEMENTS
ALONG CSAH 22, BELTRAMI COUNTY, MINNESOTA

Common Name	Scientific Name
Birds	
American Woodcock	*Scolopax minor*
Blue Jay	*Cyanocitta cristata*
Blue-Winged Teal	*Anas discors*
Hooded Merganser	*Lophodytes cucullatus*
Mallard	*Anas platyrhynchos*
Northern Cardinal	*Cardinalis cardinalis*
American White Pelican	*Pelecanus erythrorhynchos*
Pine Siskins	*Carduelis pinus*
Raven	*Corvus corax*
Red-Tailed Hawk	*Buteo jamaicensis*
Snowy Egret	*Egretta thula*
White-Throated Sparrow	*Zonotrichia albicollis*
Amphibians	
Leopard Frog	*Rana pipiens*
Reptiles	
Garter Snake	*Thamnophis sirtalis*
Painted Turtle	*Chrysemys picta*
Snapping Turtle	*Chelydra serpentina*
Mammals	
Beaver	*Castor canadensis*
Ground Squirrel	*Spermophilus franklinii*
Red Squirrel	*Tamiasciurus hudsonicus*
White-Tailed Deer	*Odocoileus virginianus*

3.1 GENERAL DESCRIPTION OF THE PROJECT STUDY AREA

The proposed survey area consists of approximately 10.8 kilometers (6.7 miles) along an existing gravel road that transects various natural habitats and second-growth forest systems within the Chippewa National Forest. Actively managed landscape types such as residential yards and public water access to North Twin Lake also occurs within the study area. The vegetation

present along the edges of CSAH 22 within 15.24 meters (50 feet) of the centerline of the existing gravel road or within the limits of construction of the proposed roadway improvements, consists primarily of wetland grasses and grass-like plants (sedges and rushes), wetland forest systems (white cedar, black spruce, tamarack, and black ash), shrub-dominated wetlands (red alder, bog birch, and willow), and upland woodland and forest systems (sugar maple, basswood, aspen, cottonwood, and balsam fir) in various stages of natural succession following logging.

The study area includes the following principal habitats:

- Ponds and Open Water (lakes and small open-water wetlands)
- Palustrine Emergent Wetlands (sedge meadows, cattail marshes, mixed emergent marshes, bogs, and rich and poor fens)
- Palustrine Scrub-Shrub Wetlands (willow swamps and alder swamps)
- Palustrine Forested Wetlands (tamarack swamps, black spruce swamps, lowland hardwood forests, and black ash swamps)
- Northern Mesic Hardwood Forest (maple/basswood forest and successional aspen/balsam fir woodlands)
- Non-Native Dominated Grasslands (existing roadway clearing and woodland/grassland edge)
- Residential and Commercial Properties (residential and commercial landscapes and maintained utility corridors)

Each of the principal habitat types identified along the proposed study area is described below:

Ponds and Open Water Wetlands (Photo 6): Few areas of open water are located within the survey area. North Twin Lake is the largest water body immediately adjacent to the proposed right-of-way, although only the vegetated shoreline and associated wetlands fell within the survey limits (see Figure 3-9). Other small, open water wetlands occur in association with emergent wetland systems. Most often, those small wetlands are located on the upstream end of stormwater culverts and typically were under 0.25 acres in size (see Appendix B, Photo 6). Common vegetation within open water wetlands includes aquatic plants, such as water lilies (*Nymphaea* and *Nuphar*), pondweeds (*Potamogeton*), and coon's tail (*Ceratophyllum*).

Palustrine Emergent Wetlands (Photo 6): The areas of palustrine emergent wetlands (PEM) along the proposed study area are composed primarily of native vegetation such as sedges (*Carex spp*.), grasses (*Calamagrostis canadensis, Glyceria spp*., and *Zizania aquatica*) and various wetland forbs (*Sagittaria spp*., *Petasites sp*., *Ranunculus spp*., *Polygonum spp*.). Occasional encroachment of cattails (*Typha latifolia* and *T. angustifolia*), reed canary grass (*Phalaris arundinacea*), and giant reed (*Phragmites australis*), was observed within areas of past disturbance and vegetation maintenance (former pastures, power line right-of-ways, and roadside edges, etc.). Occasional encroachment of native shrubs such as willow, alder, and bog birch was observed in undisturbed emergent wetlands, especially along seasonally flooded edges. Some emergent marshes and wet meadows are composed of monotypic stands of lake sedge (*Carex lacustris*) and aquatic sedge (*Carex aquatilis*), with several other species present.

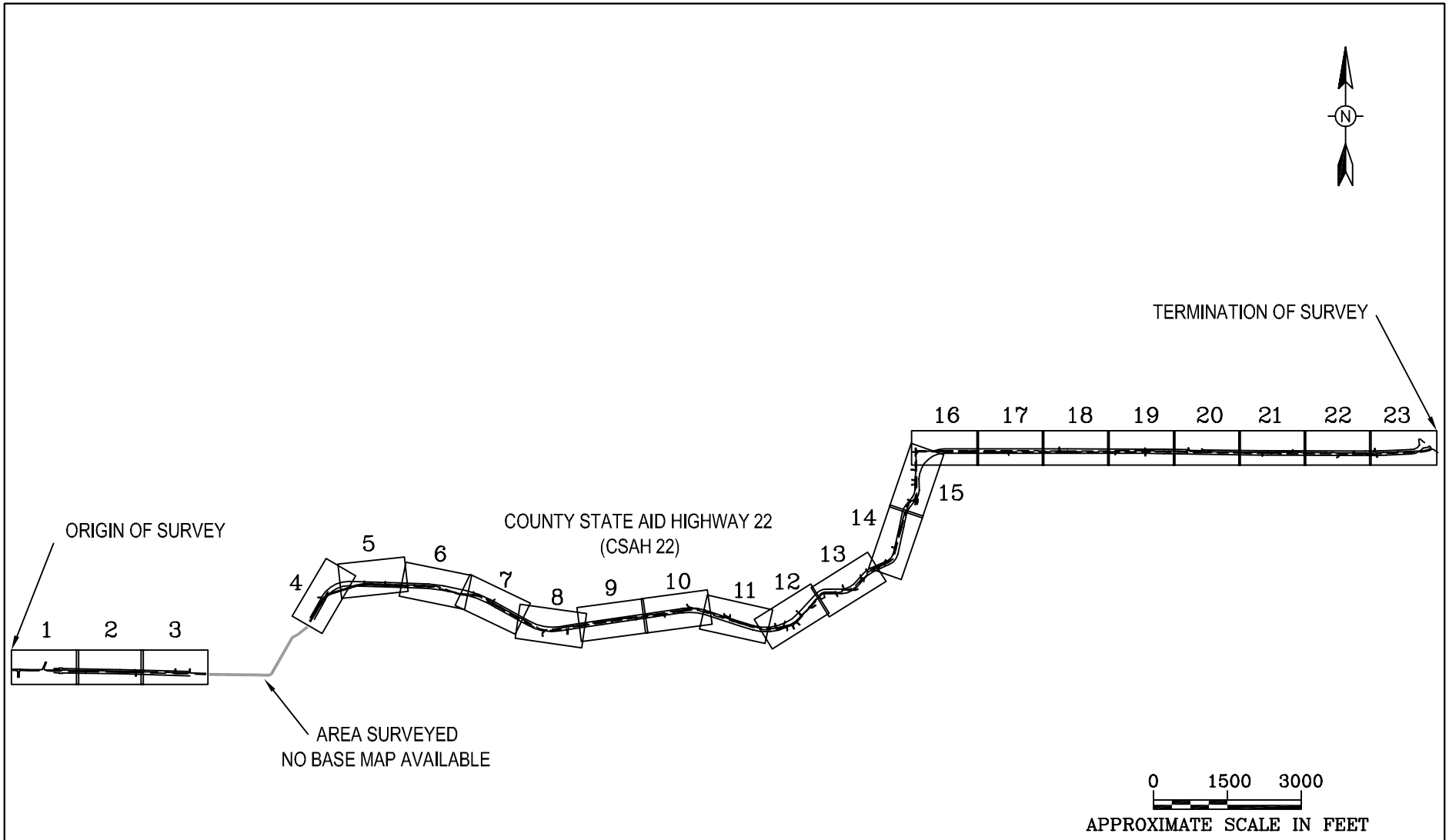
Palustrine Scrub-Shrub Wetlands (Photo 2): Palustrine scrub-shrub wetlands commonly are associated with forested wetlands that are regenerating from past disturbances. Red alder swamps (*Alnus incana*) and willow swamps (*Salix spp.*) are the common shrub swamps found within the proposed study area. Most commonly, red alder swamp was observed in association with disturbed tamarack swamp and white cedar swamp. Generally, alder swamps are very densely vegetated with red alder, with few herbaceous species in the emergent ground layer. Willow swamps most commonly are associated with wet meadows and mixed emergent marshes, and are dominated by sedges (*Carex spp.*) in the emergent herbaceous layer.

Palustrine Forested Wetlands (Photos 8 and 13): The palustrine forested wetlands in the survey area consists primarily of white cedar (*Thuja occidentalis*), black spruce (*Picea marinara*), and tamarack (*Larix laricina*) swamps occurring within semi-permanently flooded and permanently flooded wetland systems. Black ash (*Fraxinus nigra*) dominated swamps occasionally was encountered in seasonally flooded depressions. White cedar swamps are the most common and highest quality forested wetland systems within the study area. White cedar swamps typically are composed of a dense white cedar canopy, a sparse shrub layer, and a diverse herbaceous layer comprised of characteristic sedges (*Carex spp.*), ferns (*Dryopteris cristata, Botrychium virginianum, Thelypteris palustris*), several orchid species (*Cypripedium calceolus, Corallorrhiza spp., Platanthera hyperborea*), and a dense, moist moss layer (*Sphagnum spp.*). Frequent saturated and inundated depressions among white cedar root systems provide habitat for additional aquatic and emergent species, such as march marigold (*Caltha palustris*) and the uncommon small yellow water crowfoot (*Ranunculus gmelini*).

Northern Mesic Hardwood Forest (Photo 12): Northern mesic hardwood forests are the predominant upland forest type of upland areas within the study area. Those forest systems most commonly are dominated by sugar maple (*Acer saccharum*) and basswood (*Tilia americana*) that have regenerated from past logging activities. None of the forests systems are 'old-growth' forest systems. The shrub layer of the mesic hardwood forests is composed primarily of wild current (*Ribes spp.*), nannyberry (*Viburnum rafinesquei*) and serviceberry (*Amelanchier sp.*). The ground layer is dominated by Pennsylvania sedge (*Carex pennsylvanica*), wild ginger (*Asarum canadense*), and several fern species.

Non-Native Dominated Grasslands (No Photo): Most of the upland edges of the existing roadway grade had been cleared and planted with non-native grasses, such as *Poa spp., Bromus inermis, Phleum pratense*. Occasional native species, such as bracken fern, aspen, and wild strawberry, have reestablished along the woodland/grassland edge. Most notably of those pioneer natives are the ram's-head lady's slipper orchids (*Cypripedium calceolus, C. reginae,* and *C. acaule*), which tend to prefer edge habitats such as those.

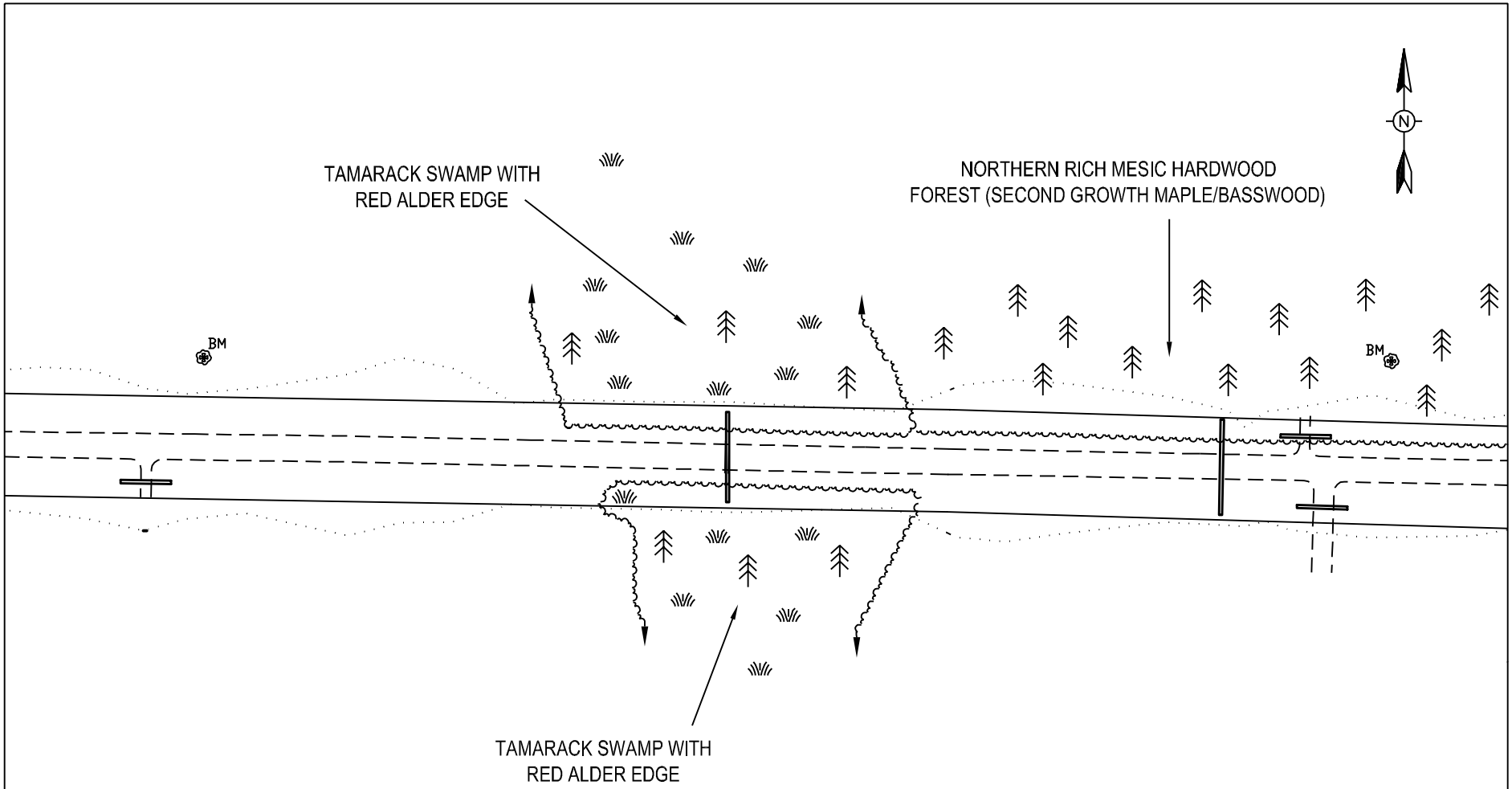
Residential and Commercial Properties (Photo 9): Occasional residential landscapes are located east of North Twin Lake. Typically within residential landscapes, woodland and forest understories are absent, having been cleared and replaced with planted turf grasses (*Poa spp.*). Access drives and residential structures further have fragmented natural habitats.



BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-1
SURVEY AREA AND BASEMAP
SECTIONS OF CSAH 22

TETRA TECH EM INC.



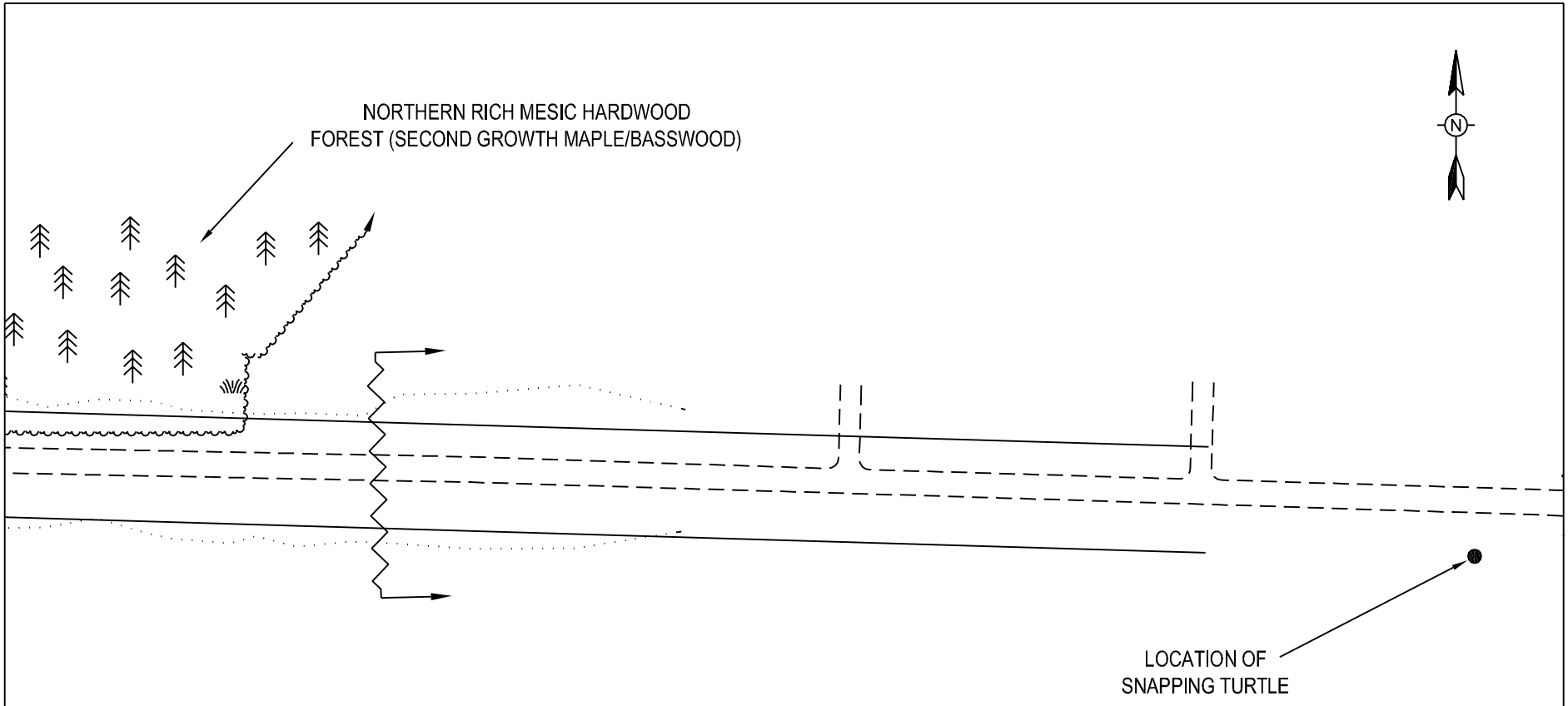
LEGEND

- EXISTING ROADWAY
- PROPOSED ROADWAY
- LIMITS OF CONSTRUCTION
- LIMIT OF SURVEY AREA
- EXISTING OR PROPOSED CULVERT
- FORESTED WETLAND
- FORREST

BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-2
FIGURE 2 OF 23
CSAH 22 SITE LAYOUT

TETRA TECH EM INC.



0 75 150

APPROXIMATE SCALE IN FEET

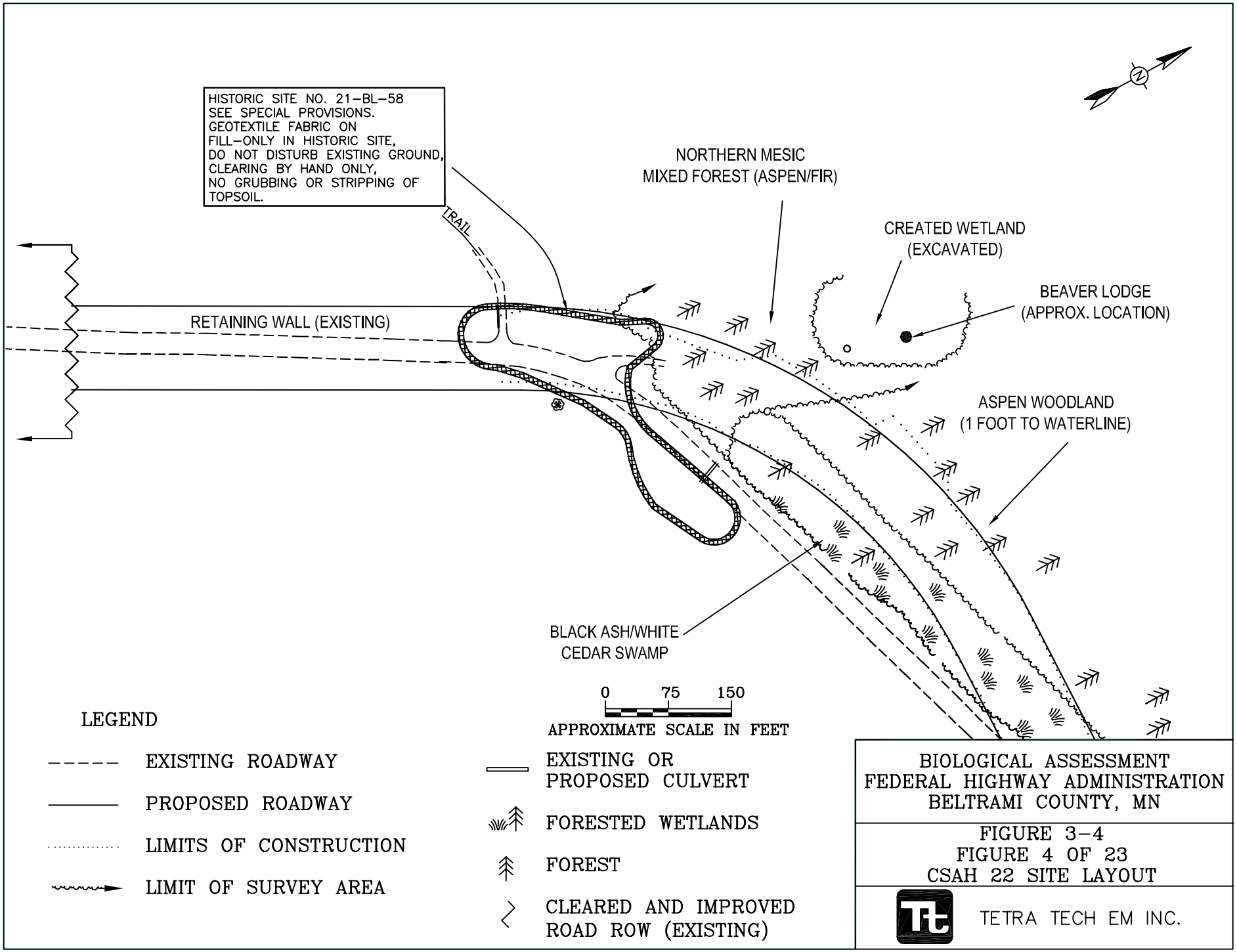
LEGEND

- EXISTING ROADWAY
- PROPOSED ROADWAY
- LIMITS OF CONSTRUCTION
- LIMIT OF SURVEY AREA
- EXISTING OR PROPOSED CULVERT
- WETLAND
- FOREST
- CLEARED AND IMPROVED ROAD ROW (EXISTING)

BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-3
FIGURE 3 OF 23
CSAH 22 SITE LAYOUT

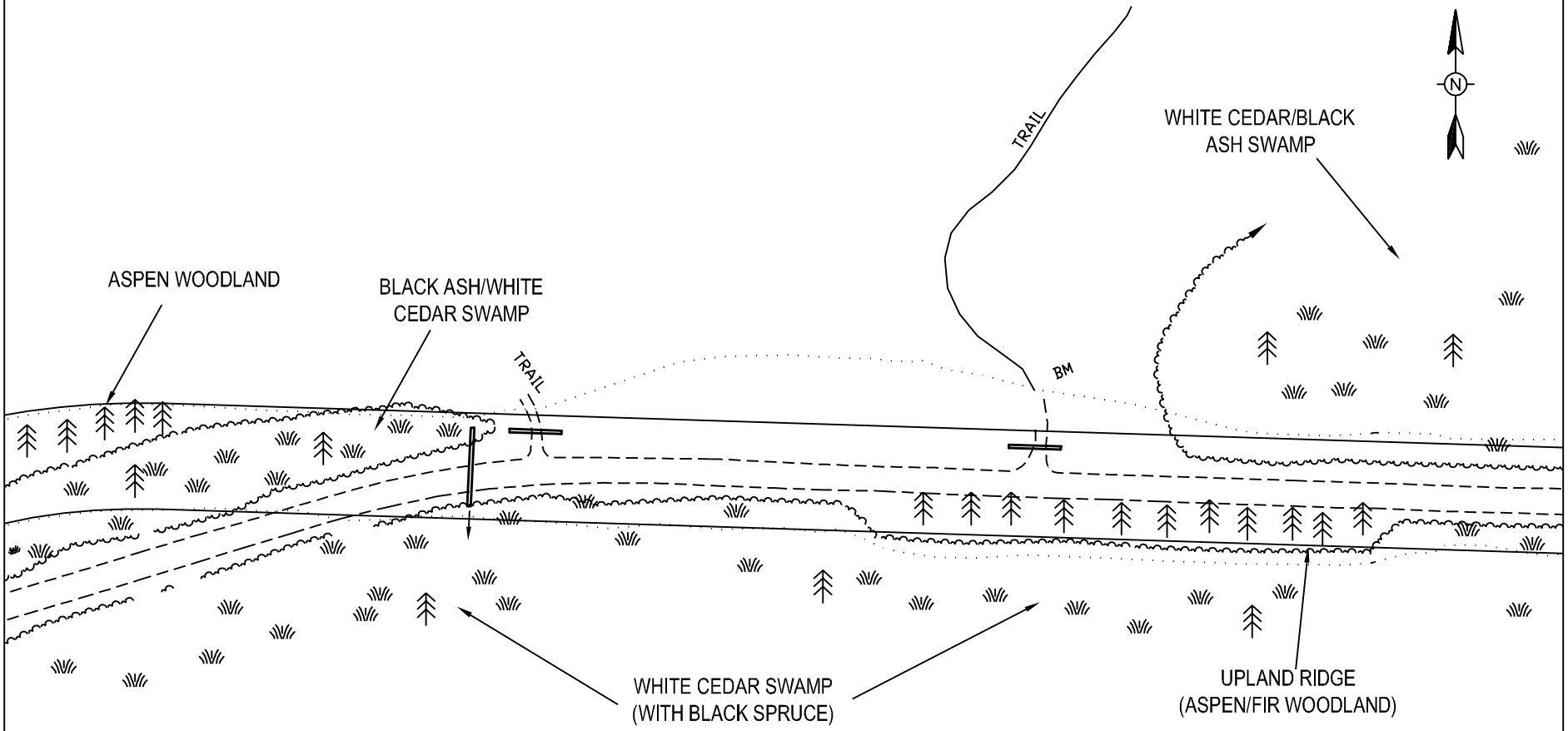
TETRA TECH EM INC.



BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-4
FIGURE 4 OF 23
CSAH 22 SITE LAYOUT

TETRA TECH EM INC.



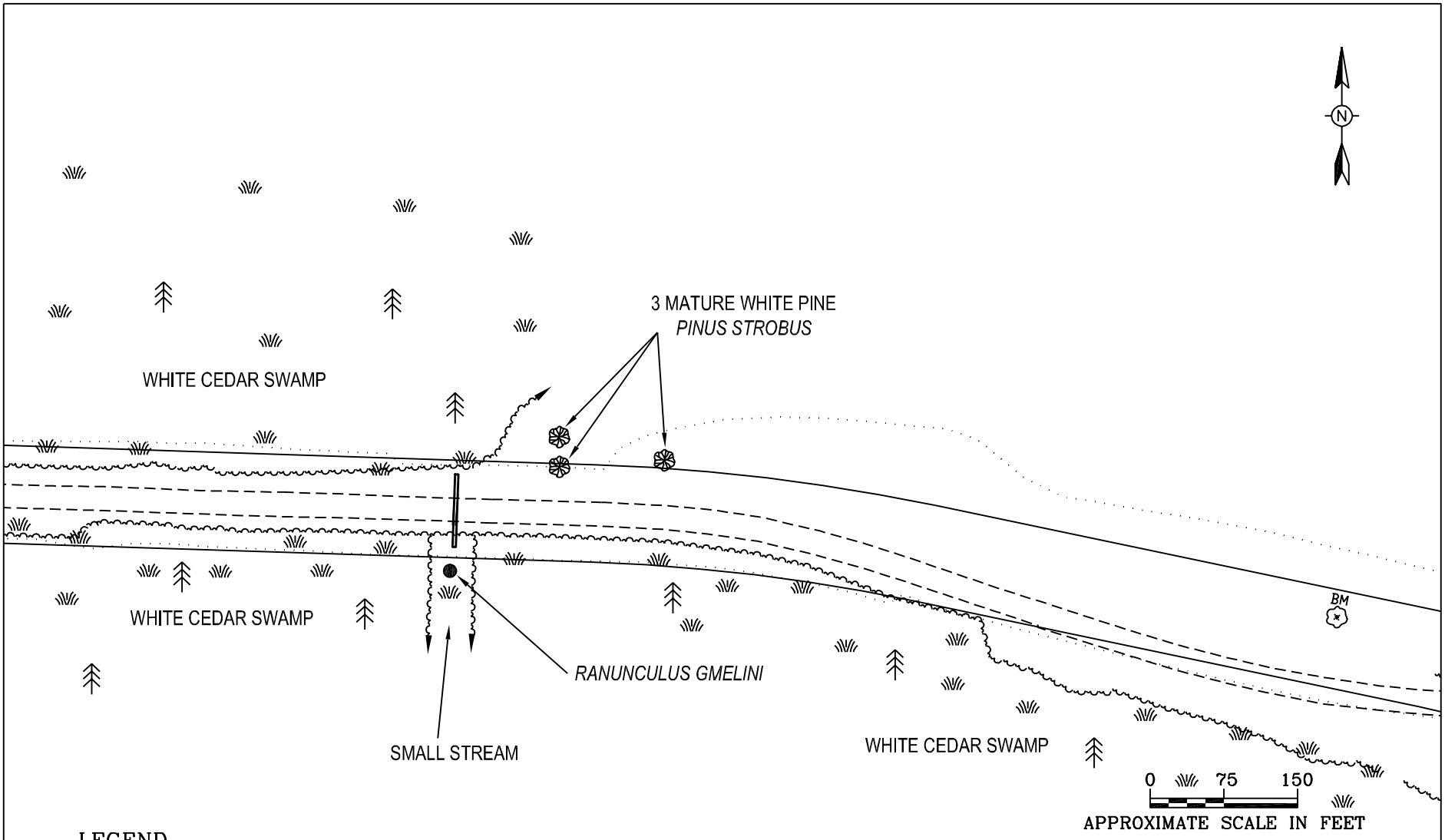
LEGEND

- EXISTING ROADWAY
- PROPOSED ROADWAY
- LIMITS OF CONSTRUCTION
- LIMIT OF SURVEY AREA
- EXISTING OR PROPOSED CULVERT
- FORESTED WETLAND
- FOREST

BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-5
FIGURE 5 OF 23
CSAH 22 SITE LAYOUT

TETRA TECH EM INC.



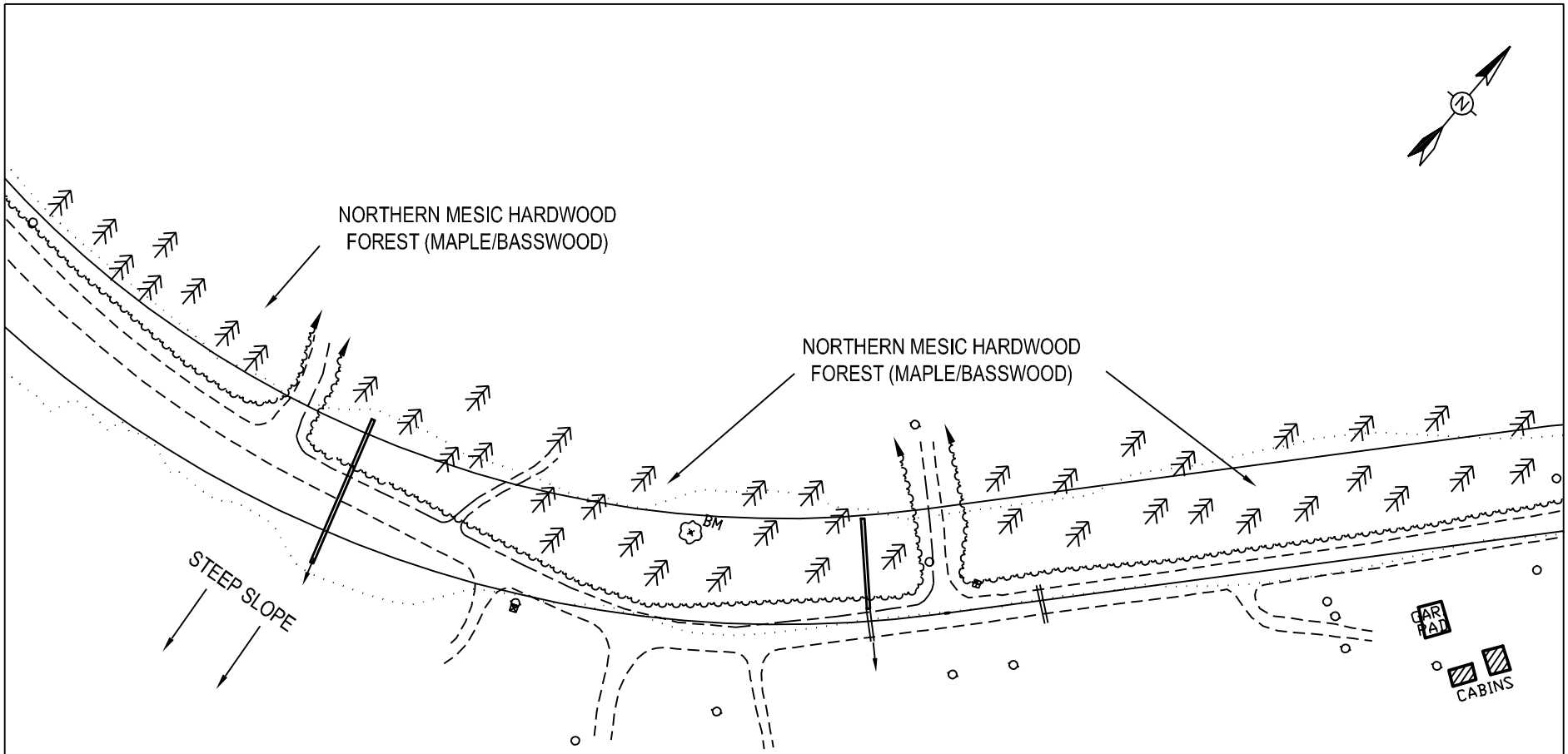
LEGEND

- EXISTING ROADWAY
- PROPOSED ROADWAY
- LIMITS OF CONSTRUCTION
- LIMIT OF SURVEY AREA
- EXISTING OR PROPOSED CULVERT
- FORESTED WETLAND

BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-6
FIGURE 6 OF 23
CSAH 22 SITE LAYOUT

TETRA TECH EM INC.



0 75 150

APPROXIMATE SCALE IN FEET

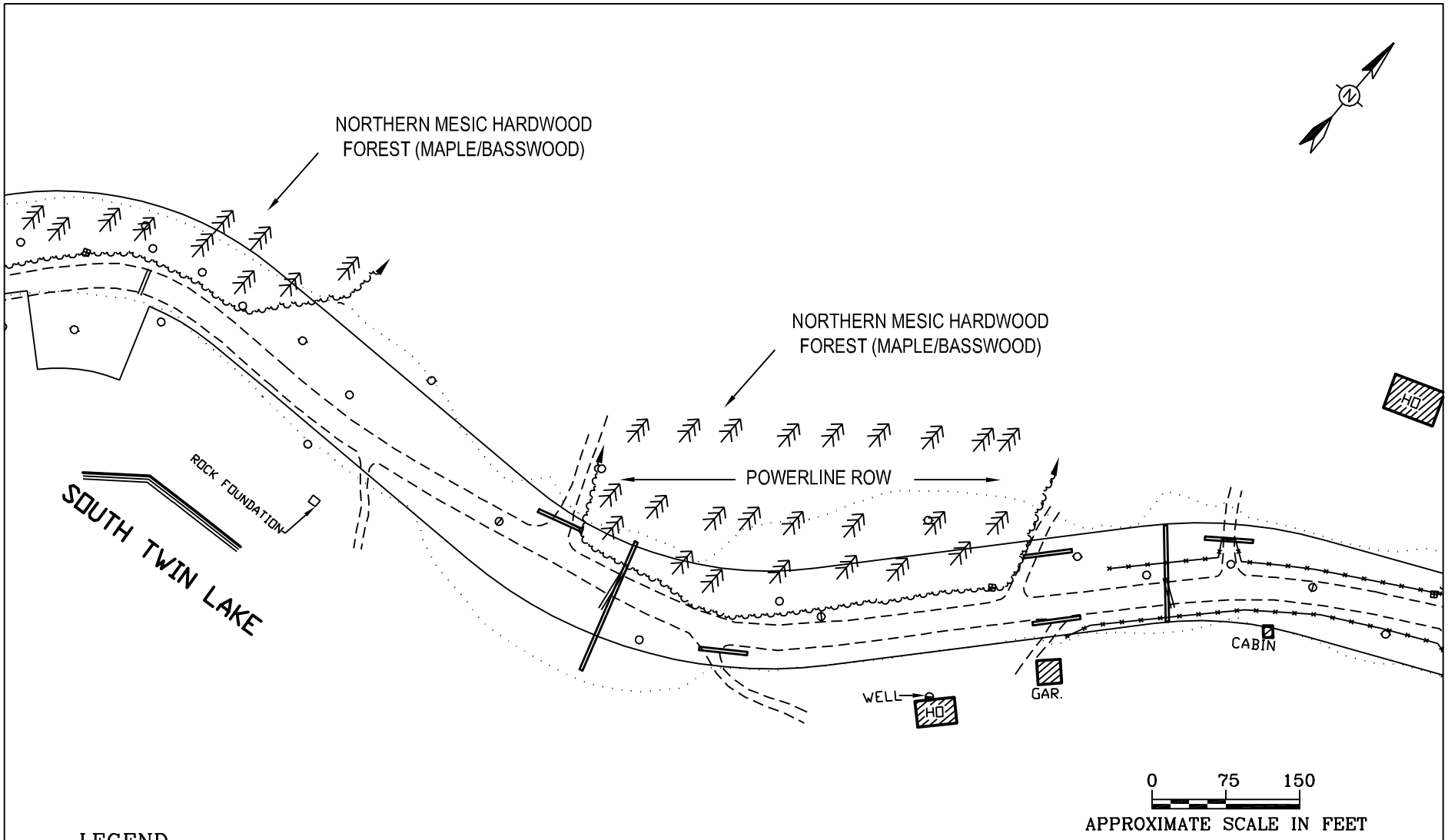
LEGEND

- EXISTING ROADWAY
- PROPOSED ROADWAY
- LIMITS OF CONSTRUCTION
- LIMIT OF SURVEY AREA
- EXISTING OR PROPOSED CULVERT
- SWAMP
- FOREST

BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-7
FIGURE 7 OF 23
CSAH 22 SITE LAYOUT

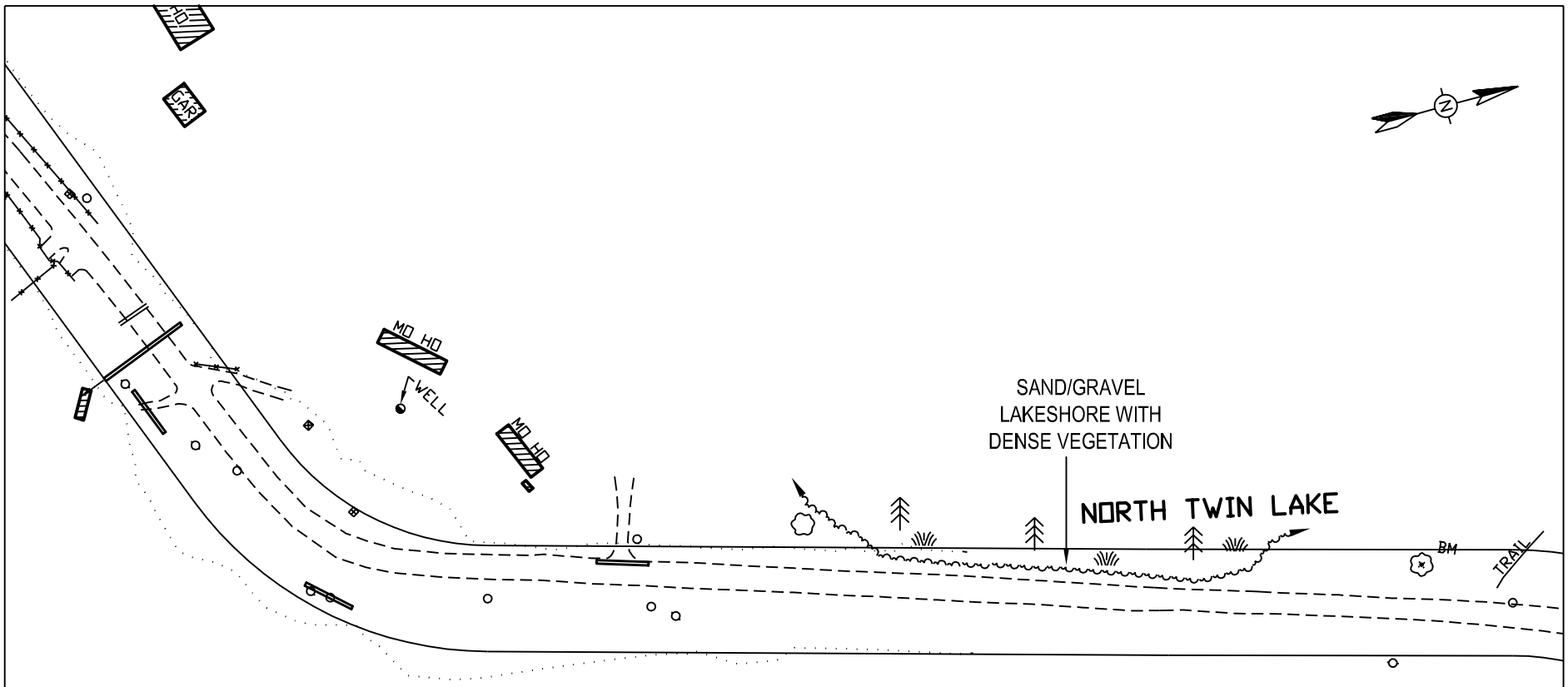
TETRA TECH EM INC.



BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-8
FIGURE 8 OF 23
CSAH 22 SITE LAYOUT

TETRA TECH EM INC.



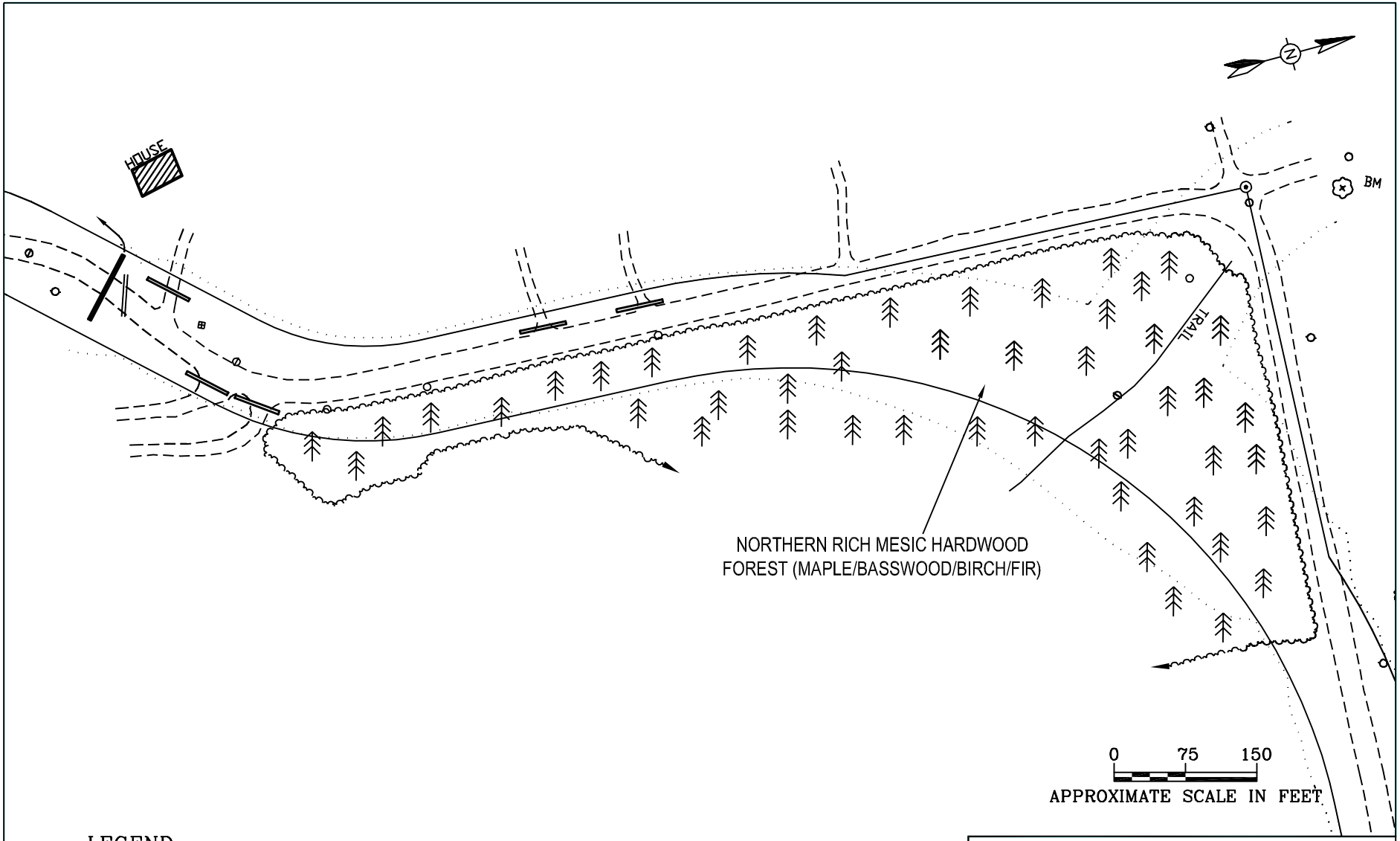
LEGEND

- EXISTING ROADWAY
- PROPOSED ROADWAY
- LIMITS OF CONSTRUCTION
- LIMIT OF SURVEY AREA
- FENCE
- EXISTING OR PROPOSED CULVERT
- FORESTED WETLANDS

BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-9
FIGURE 9 OF 23
CSAH 22 SITE LAYOUT

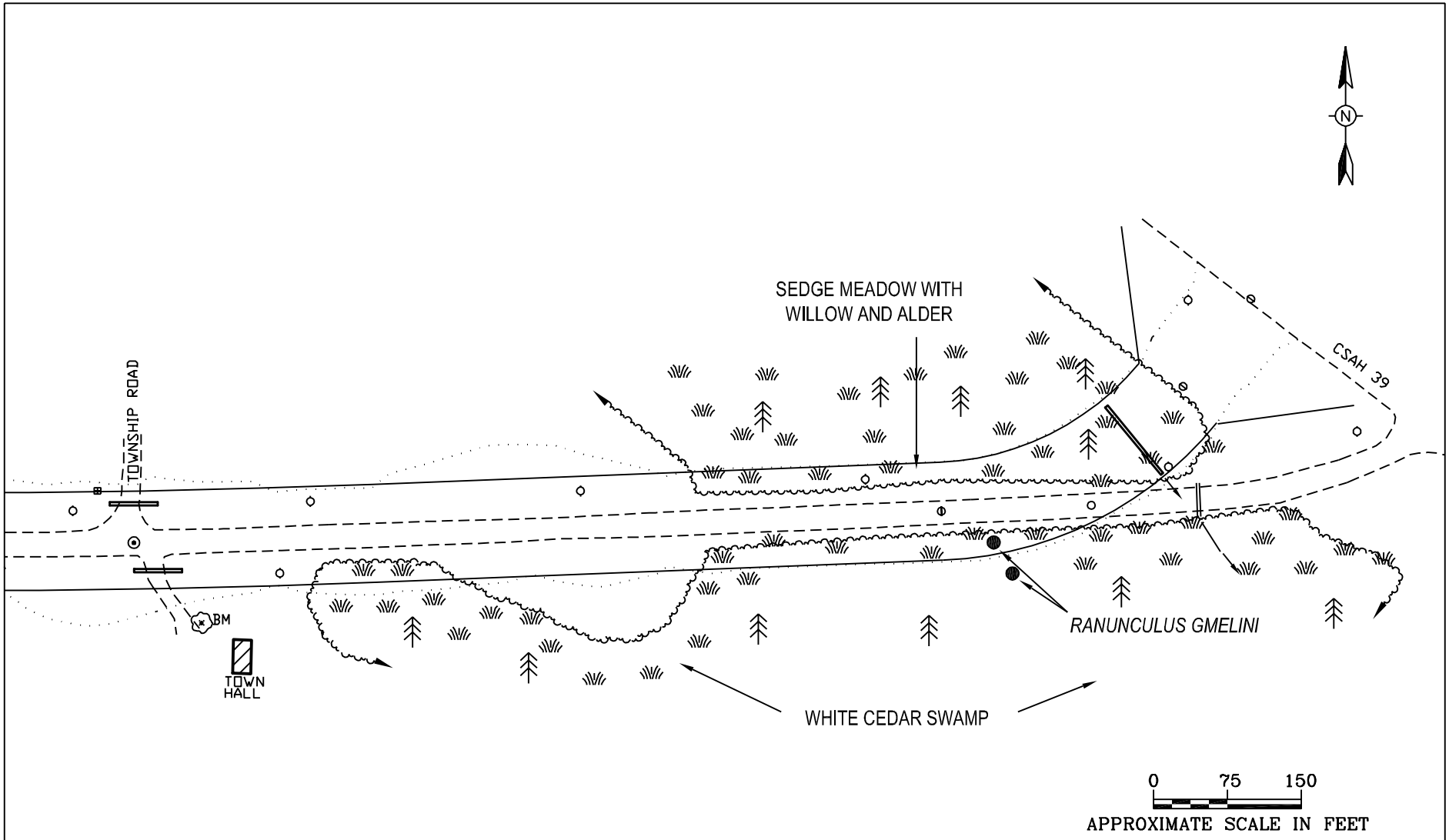
TETRA TECH EM INC.



BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-10
FIGURE 10 OF 23
CSAH 22 SITE LAYOUT

TETRA TECH EM INC.



LEGEND

- EXISTING ROADWAY
- PROPOSED ROADWAY
- LIMITS OF CONSTRUCTION
- LIMIT OF SURVEY AREA
- EXISTING OR PROPOSED CULVERT
- FORESTED WETLAND

BIOLOGICAL ASSESSMENT
FEDERAL HIGHWAY ADMINISTRATION
BELTRAMI COUNTY, MN

FIGURE 3-11
FIGURE 11 OF 23
CSAH 22 SITE LAYOUT

TETRA TECH EM INC.

4.0 HABITAT ASSESSMENT AND POTENTIAL IMPACTS

The project study area (the area within 50 feet [15.24 meters] of the centerline of CSAH 22 or within the limits of proposed roadway construction) provides suitable habitat for a variety of the species listed in Table 1-2. Table 4-1 lists the species that are presented in Table 1-2, which may utilize one or more of the wetland habitats (tamarack swamp, sedge meadow, white cedar swamp, and black ask/white cedar swamp) present in the project study area.

TABLE 4-1
STATE- AND FEDERALLY-LISTED THREATENED AND ENDANGERED SPECIES THAT UTILIZE WETLAND HABITATS

Common Name	Scientific Name	Federal Status	Minnesota Status	U.S. Forest Service Status	Suitable Habitat
Reptiles					
Blanding's turtle	*Emydoidea blandingii*	NL	T	RFSS	Y
Amphibians					
Four-toed salamander	*Hemidactylium scutatum*	NL	SC	RFSS	Y
Fish					
Greater redhorse	*Moxostorna valenciennesi*	NL	NL	RFSS	Y
Pugnose shiner	*Notropis anogenus*	NL	SC	RFSS	Y
Insects					
Vertree's caddisfly	*Ceraclea vertreesi*	NL	SC	RFSS	Y
Birds					
LeConte's sparrow	*Ammodramus leconteii*	NL	NL	RFSS	Y
Nelson's sharp-tailed sparrow	*Ammodramus nelsoni*	NL	SC	RFSS	Y
Olive-sided flycatcher	*Contopus cooperi*	NL	NL	RFSS	Y
Yellow rail	*Coturnicops noveboracensis*	NL	SC	RFSS	Y
Spruce grouse	*Falcipennis canadensis*	NL	NL	RFSS	Y
Connecticut warbler	*Oporornis agilis*	NL	NL	RFSS	Y
Wilson's phalarope	*Phalaropus tricolor*	NL	T	RFSS	Y
Mammals					
Northern bog lemming	*Synaptommys borealis*	NL	SC	RFSS	Y
Plants					
Fairy slipper	*Calypso bulbosa*	NL	NL	RFSS	Y

Common Name	Scientific Name	Federal Status	Minnesota Status	U.S. Forest Service Status	Suitable Habitat
Limestone oak fern	*Gymnocarpium robertianum*	NL	NL	RFSS	Y
One-flowered broomrape	*Orobanche uniflora*	NL	SC	RFSS	Y
Small green woodland orchid, Club-spur orchid	*Platanthera clavellata*	NL	SC	RFSS	Y
Northern bur-reek, Clustered bur-reed	*Sparganium glomeratum*	NL	SC	RFSS	Y
Canada yew	*Taxus Canadensis*	NL	NL	RFSS	Y

The impacts associated with the proposed action were evaluated using the information provided by the FWS, MDNR, and the Forest Service. The potential impacts were evaluated in accordance with FSM, Region 6 Supplement 2600-90-5, which is the guidance that the Forest Service uses to evaluate impacts on threatened, endangered, proposed, and special concern species, and regional forester sensitive species. The evaluation consists of the following factors:

Factor 1. Consequence of Adverse Effect from a Particular Activity

- Low - None, or questionable adverse effect on habitat or population. No cumulative effects expected.
- Moderate - Possible adverse effects on habitat or on population. Cumulative effects possible.
- High - Obvious adverse effects on habitat or population. Cumulative effects probable.

Factor 2. Likelihood of Adverse Effect from a Particular Activity

- None - Activity will not affect habitat or population (no further risk assessment needed).
- Low - Activity controllable by seasonal or spatial restrictions and not likely to affect habitat or populations.
- Moderate - Activity not completely controllable or intense administration of project needed to prevent adverse effects on habitat or population. Adverse effects may occur.
- High - Activity not controllable and adverse effects on habitat or populations likely to occur.

The matrix below is used to determine overall risk and the final determination.

Consequences	Likelihood	Overall Risk	Listed Species Calls	Sensitive Species Calls
Low	None	None	No effect	No impact*
Low	Low	None-Low	No effect	No impact
Low	Moderate	Low	NLTAA	MII
Low	High	Low	NLTAA	MII

Consequences	Likelihood	Overall Risk	Listed Species Calls	Sensitive Species Calls
Moderate	None	None	No effect	No impact*
Moderate	Low	Low-Moderate	NLTAA	MII
Moderate	Moderate	Moderate	LAA	MII
Moderate	High	Moderate	LAA	MII
High	None	None	No effect	No impact*
High	Low	Moderate	NLTAA	MII
High	Moderate	High	LAA	LRT
High	High	High	LAA	LRT

Listed species calls:
NLTAA - May affect, Not Likely To Adversely Affect (includes beneficial effects)
LAA - May affect, Likely To Adversely Affect

Sensitive species calls:
* in some cases could be beneficial impact
MII - May Impact Individuals but not likely to cause a trend to federal listing or loss of viability
LRT - Likely to Result in a Trend to federal listing or loss of viability

The following subsections present a habitat assessment for the threatened, endangered, proposed, and special concern species; for the RFSS; and for species that are tracked by the MDNR for potential inclusion on the state list of threatened and endangered species. The species that are listed in Table 1-2 where no suitable habitat was identified are not included in following subsections. Those species are: piping plover, Caspian tern, black tern, trumpeter swan, sharp-tailed grouse, and the white trout lily.

The Forest Service identified recorded sightings of four species listed on Table 1-2 that may be directly impacted by implementation of the proposed action. The species include the goblin fern, black sandshell and fluted-shell mussels, and the bay-breasted warbler.

4.1 THREATENED, ENDANGERED, PROPOSED, SPECIAL CONCERN, AND REGIONAL FORESTER SENSITIVE SPECIES

The following sections discuss the impacts on the threatened, endangered, proposed, special concern, and regional forester sensitive species that may occur in the project study area.

4.1.1 Reptiles

The following subsections contain a description of the habitat assessment and the potential impacts on reptile species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Common Snapping Turtle

The large emergent wetlands located to the north and south of CSAH 22, the Turtle River, and North Twin Lake, are suitable habitats for the common snapping turtle. In addition, the dry,

south-facing, and exposed roadway edges provide ideal habitat for nesting. In Minnesota, snapping turtles migrate through upland habitats during the wet spring months, and gravid females search for suitable dry (often sandy) upland areas in which to lay their eggs.

The common snapping turtle, which has been assigned special concern by Minnesota DNR, is the species that had been observed in the project study area (see Table 1-2). The proposed roadway improvements (regarding and limited clearing) and subsequent use of the new road may adversely impact individuals or the habitat of this species. Increased traffic volume and speed, as well as increased road widths may increase the mortality rate of snapping turtles migrating across the roadway in search of suitable upland nesting sites. Mitigation measures outline in Section 5 are expected to protect the habitat and individual snapping turtles that use the project study area. The impacts associated with the proposed action with implementation of the mitigation measures may impact habitat or individuals, but is not likely to cause a trend towards federal listing or cause a loss of viability.

Blanding's Turtle

There are some sandy soils along CSAH 22 within the project study area that could serve as possible nesting sites for Blanding's turtle. The swamp habitats within and adjacent to the project study area may serve as potential feeding, breeding, or over wintering habitat. Neither the clearing nor re-grading of small portions of the project study area should make this habitat unsuitable for the Blanding's turtle. The proposed roadway improvement project with its associated mitigation measures presented in Section 5 of this report is not expected to interfere with dispersal and will have no impact on Blanding's turtle.

4.1.2 Amphibians

The following subsections contain a description of the habitat assessment and the potential impacts on amphibian species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Four-Toed Salamander

The swamps and boggy streams within the project study area may provide suitable habitat for the four-toed salamander. A temporary increase in sedimentation and turbidity may have a negative effect on the aquatic larvae. Mitigation measures to minimize sedimentation into wetlands, as identified in Section 5 of this report, would protect individuals and their habitat. The creation of gravel shoulders and grass lined drainage swales may affect the spring migration of adults to and from lowland forests and wetlands for breeding. However, the existing road probably presents a minor barrier to spring migration because the lowland forest/wetland interface is so vast in the surrounding area. The proposed roadway improvement project also includes the installation of a culvert to restore the natural hydrology of the area and would potentially create additional habitat, as well as potentially may provide a migration route under the barrier (existing CSAH 22). Implementation of the proposed action may adversely impact individuals or habitat, but

likely will not to cause a trend towards federal listing or a loss of viability for the population or species.

4.1.3 Fish

The following subsections contain a description of the habitat assessment and the potential impacts on fish species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Greater Redhorse and Pugnose Shiner

Habitat for greater redhorse and pugnose shiner may exist in the Turtle River and in North and South Twin Lakes within the project study area; however, no formal surveys have been completed. Sedimentation from grading and roadway improvement may impact habitat by smothering interstitial spaces in coarse substrates required for invertebrate food production and egg incubation. No construction activities would occur in open water or in the streams and rivers within the project study area. The mitigation measures outlined in Section 5 of this report that focus on sediment and run-off control would prevent any negative impacts on this species or its habitat.

4.1.4 Insects

The following subsections contain a description of the habitat assessment and the potential impacts on insect species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Vertree's Caddisfly

Appropriate habitat may exist for this species in Turtle River and North and South Twin Lakes. Siltation of aquatic habitats during grading and roadway improvement activities may result in adverse impacts on this species or its habitats. No construction activities would occur in open water or in the streams and rivers within the project study area. The mitigation measures outlined in Section 5 of this report that focus on sediment and run-off control would prevent any negative impacts on this species or its habitat.

4.1.5 Mussels

The following subsections contain a description of the habitat assessment and the potential impacts on mussel species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Creek Heelsplitter, Black Sandshell, and Fluted-shell Mussels

The creek heelsplitter mussel is found in creeks and the headwaters of small- to medium-sized rivers in fine gravel or sand. It rarely is found in larger rivers (NPS 2001). The species is sensitive to sedimentation and runoff from urban development and roads. The creek heelsplitter mussel may be found in Turtle River, but most likely does not occur within North or South Twin Lakes. No creek heelsplitter mussels were noted in Turtle River during the pedestrian survey completed in June 2002. The proposed roadway improvement project with its associated mitigation measures presented in Section 5 of this report will have no impact on creek heelsplitter mussels.

The black sandshell mussel is found in medium to large rivers, dwelling in riffles or raceways in gravel or firm sand. In 1995, the species was reported in low numbers in several northern rivers, but it appears to be doing well in the Chippewa River in Chippewa and Swift counties in western Minnesota (MDNR 1995). The fluted-shell mussel occurs in medium to large rivers in sand, mud, or fine gravel in areas with slow to moderate flow. Both the black sandshell and the fluted-shell mussels have been found in Turtle River, outside of and upstream of the project study area. No black sandshell or fluted-shell mussels were noted in Turtle River during the pedestrian survey completed in June 2002.

The proposed roadway improvement project may adversely impact the black sandshell and fluted shell mussels. Siltation of the aquatic habitats in Turtle River during grading and roadway improvement activities may result in adverse impacts on this species or its habitats. No construction activities would occur in open water or in the streams and rivers within the project study area. The mitigation measures outlined in Section 5 of this report that focus on sediment and run-off control would prevent any negative impacts on this species or its habitat.

4.1.6 Birds

The following subsections contain a description of the habitat assessment and the potential impacts on bird species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Bald Eagle

Bald eagles nest and forage in forested areas located at the edge of open waters that support the eagle's chief prey, fish. Large, mature white pine trees, 60 to 76 cm (24 to 30 inches) in diameter at breast height) located in close proximity to Turtle River and North Twin Lake, offer potential roosting and nesting habitat for bald eagles. Several of those trees fall within the limits of the proposed roadway construction. No know bald eagle nests are within 1,320 feet of the project study area and no nests were observed during the June 2002 field assessment; consequently, there are no restrictions related to essential bald eagle habitat.

The removal, cutting and filling, or other damage to the mature white pine (*Pinus strobus*) trees within the project study area adjacent to open water (North and South Twin Lakes) may result in minor impacts to the potential nesting and roosting habitat of the bald eagle. Additional vehicular traffic associated with the proposed roadway improvements also likely would deter bald eagles from nesting or roosting in white pine trees immediately adjacent to the proposed new roadway. Large tracts of secluded habitat suitable for bald eagles to nest and forage include the four local large water bodies, North Twin Lake, South Twin Lake, Turtle River Lake, and Pimushe Lake. The proposed roadway improvement project with its associated mitigation measures presented in Section 5 of this report is not expected to interfere with nesting or foraging and will have no impact on the bald eagle.

Red-Shouldered Hawk

The red-shouldered hawk prefers woodland habitats, especially lowland hardwood forests and swamps. Like the bald eagle, hawks hunt from a perch, typically found in roadside areas. The riparian floodplains associated with the Turtle River and conifer swamp edges along CSAH 22 are suitable habitat for red-shouldered hawks. The hawks potentially could use the large white pine trees that are located in close proximity to both North Twin Lake and Turtle River as perches and nesting sites.

The removal, cutting and filling, or other damage to the mature white pine (*Pinus strobus*) trees within the project study area adjacent to open water (the Turtle River and North Twin Lake) may result in minor impacts to the nesting and roosting habitat of the red-shouldered hawk. The additional vehicular traffic may deter the red-shouldered hawk from nesting adjacent to the proposed roadway improvement, but would not deter the hawk from utilizing the roadside habitat as a foraging area. Large tracts of secluded habitat suitable for red-shouldered hawks to nest and forage include the four local large water bodies, North Twin Lake, South Twin Lake, Turtle River Lake, and Pimushe Lake. The proposed roadway improvement project with its associated mitigation measures presented in Section 5 of this report is not expected to interfere with nesting or foraging and will have no impact on the red-shouldered hawk.

Northern Goshawk

The northern goshawk nesting and foraging territory is the Wagner Lake South and portions of the surrounding area. The project study area does not enter into the nesting or foraging territory of the northern goshawk. The proposed project will not impact the northern goshawk.

LeConte's Sparrow

The proposed roadway improvement project will impact a limited amount of potential habitat in the wet meadows along existing CSAH 22. Implementation of the proposed action may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Nelson's Sharp-Tailed Sparrow

The proposed roadway improvement project will impact a limited amount of potential habitat in the wet meadows along existing CSAH 22. Implementation of the proposed action may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Olive-Sided Flycatcher

The proposed roadway improvement project will impact a limited amount of potential habitat in the wet meadows and beaver meadows along existing CSAH 22. Implementation of the proposed action may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Yellow Rail

The proposed roadway improvement project will impact a limited amount of potential habitat in the sedge meadows and grassy marshes along existing CSAH 22. Implementation of the proposed action may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Bay-Breasted Warbler

The bay-breasted warbler is highly associated with outbreaks of spruce budworm in mature spruce-fir forests, and is dependent on these insects to rear nestlings. The only record of this species in the Chippewa National Forest is located 1.2 miles from the project study area. The removal of spruce and fir trees associated with the proposed roadway improvement project may adversely impact suitable habitat of the bay-breasted warbler. Implementation of the proposed action likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Spruce Grouse

The proposed action would impact limited amounts of suitable habitat. Marginal habitat quality, limited suitable habitat quantities, and lack of change of landscape character negated the need for surveys for this species. Implementation of the proposed action likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Connecticut Warbler

Extremely limited quantities of potential suitable habitat located within the project study area may be impacted by the proposed project. Due to the limited potential impacts, surveys were not prescribed. Implementation of the proposed action would likely have no impact on the Connecticut warbler.

Wilson's Phalarope

The proposed roadway improvement project will impact a limited amount of potential habitat in the shallow pools bordered by wet meadows along existing CSAH 22. Implementation of the proposed action may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Black-Backed Woodpecker

The black-backed woodpecker has been sighted along CSAH 22. The species is a resident of old-growth boreal coniferous forests with decadent trees and snags, and depends heavily on the larvae of wood-boring beetles. No old-growth boreal coniferous forest is located in the project study area, but the removal of snags and insect-infected trees may result in a loss of suitable foraging habitat. Implementation of the proposed action may impact individuals or habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Great Gray Owl

Limited quantities of potential nesting and foraging habitat occur in the project study area. As such, implementation of the proposed action would likely have no impact on the great gray owl.

4.1.5 Mammals

The following subsections contain a description of the habitat assessment and the potential impacts on mammal species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Canada Lynx and Gray Wolf

Within Minnesota, the home range of both the Canada lynx and the gray wolf include large tracts of old growth forest and scrub-shrub land habitat. Undisturbed areas of old growth forest and scrub-shrub habitat that would provide suitable habitat for the home range of both the Canada lynx and the gray wolf are located in close proximity to the project study area. Examining the project study area from a landscape-scale perspective and considering that a gravel road already exists over the majority of the area of the proposed roadway improvement, only relatively insignificant additional impacts would occur to the habitat of Canada lynx and gray wolf. The impacts would be considered to be insignificant because the habitat that would be affected by the proposed roadway improvement currently is disturbed marginal quality habitat adjacent to the existing gravel road.

Northern Bog Lemming

Several large areas of sedge-dominated wet meadow habitat, coniferous lowland forest, shrub-dominated wetlands, and ericaceous bogs with a *Sphagnum*-dominated ground layer were encountered within the proposed right-of-way expansion. Although the proposed project occurs within much suitable habitat, historic records and local literature indicates the northern bog lemming is very uncommon in northern Minnesota. This species tends to occur only in small, isolated breeding populations. Furthermore, known populations of the northern bog lemming in Minnesota tend to occur away from human disturbance and development (such as existing roads). Expansion and improvement of the existing roadway will impact habitats that are of a quality that only are marginally suitable for this species. Implementation of the proposed action may impact individuals or relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

4.1.6 Plants

The following subsections contain a description of the habitat assessment and the potential impacts on plant species that are listed as threatened, endangered, special concern, or sensitive where suitable habitat for such species has been identified in the project study area.

Blunt-Lobed Grapefern

The blunt-lobed grapefern (*Botrychium oneidense*) was first discovered in Cass County in 1992 within moist depressions of northern hardwood forests. Along the proposed project corridor, very few moist forest depressions occur that would be suitable for this species. However, the ephemeral pools were surveyed for the presence of the blunt-lobed grapefern, and no populations were found during the June 2002 surveys. Implementation of the proposed action may impact individuals or relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Pale Moonwort

Pale moonwort (*Botrychium pallidum*) is known to occur within northern hardwood forests and pine forests. In Minnesota, this species is very rare and cryptic, and most populations have been documented within the past ten years since the species first had been detected in the state in 1992. Recent discoveries of pale moonwort within the Chippewa National Forest (in Cass County) were within maple and basswood-dominated hardwood forest tracts.

The greatest potential impact to the suitable habitats of the moonwort ferns is associated with the roadway realignment at the intersection of CSAH 22 and Forest Road 3213, east of North Twin Lake (see Figure 3-10). That forest habitat was surveyed extensively, and it appeared to be a former pasture typified by compacted soils and poor soil development, which lacked leaf litter; all factors which impede the establishment and persistence of moonwort ferns. No individual plants or populations were found during the June 2002 surveys. Implementation of the proposed

action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Ternate Grapefern

The ternate grapefern (*Botrychium rugulosum*) is very rare in northern Minnesota and throughout its range. This species is known to occur within pine forests and forested wetland margins. Although no suitable pine forest habitat was documented within the project study area, several forested wetland margins were surveyed for the presence of this species. No individuals or populations of ternate grapefern were detected during the June 2002 surveys within the project study area. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Least Moonwort

The least moonwort (*Botrychium simplex*) often occurs in association with *Botrychium mormo* (goblin fern), both ferns preferring northern hardwood forests habitats in northern Minnesota. Several tracts of maple/basswood forest and mixed coniferous/deciduous forest will be impacted along the proposed roadway improvement corridor.

The greatest potential impact to the suitable habitats of the moonwort fern is associated with the roadway realignment at the intersection of CSAH 22 and Forest Road 3213, east of North Twin Lake (see Figure 3-10). However, this forest habitat was surveyed extensively, and appears to be a former pasture typified by compacted soils, poor soil development, which lacks leaf litter, all factors which impede the establishment and persistence of moonwort ferns. No individuals or populations of least moonwert were identified during the June 2002 surveys. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Goldie's Woodfern

Dryopteris goldiana generally occurs in moist soil on north- and east-facing wooded slopes in southeastern Minnesota. However, five disjunct populations were documented in North-Central Minnesota, north of Leech Lake in Cass County between 1975 and 1992, and one population was recorded in the Chippewa National Forest in Itasca County in 1999. All of the northern populations occur in association with closed canopy maple/basswood forest.

Within the proposed project area, several second-growth maple/basswood forest stands were documented and searched for the presence of Goldie's woodfern. However, the maple/basswood stands within the proposed project area typically were disturbed by past land use practices such as logging and grazing, and most had compacted soils, poor soil redevelopment, and little

remaining duff layer. Such areas were searched thoroughly in June 2002 for the presence of *Dryopteris goldiana*. No individuals or populations were found.

Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species

Olivaceous Spike-Rush

Eleocharis olivacea is known to occur within a variety of wetland and aquatic habitats within northern Minnesota, including floating sedge mats, lake beaches, and river margins. Three populations have been documented in Minnesota (all from north central Minnesota). Although many suitable palustrine, riverine, and lacustrine wetland habitats were surveyed along the proposed corridor for this species, no populations were found during the June 2002 surveys. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Few Flowered Spike Rush

Eleocharis pauciflora is known to occur within a variety of wetland and aquatic habitats within Northern Minnesota, including floating sedge mats, lake beaches, and river margins. It is known to occur within the Chippewa National Forest, and was last documented there in 1925 on the beach of Ball Club Lake in Cass County. Although many suitable palustrine, riverine, and lacustrine wetland habitats were surveyed along the proposed corridor for this species, no populations were found during the June 2002 surveys. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

One-Flowered Broomrape

Orobanche uniflora typically occurs in the southeastern section of Minnesota, although one disjunct occurrence was recorded within the Chippewa National Forest in north central Minnesota. The Chippewa population was found in a transition zone between white cedar swamp and northern hardwood forest in 1997. Several such transition zones were encountered along the proposed project corridor. Such areas located within the proposed project limits were searched extensively in June 2002 for the one-flowered broomrape, but no populations were found. Due to this species' southern affinity and local rarity, it is not likely that any populations or individuals occur within the proposed project corridor. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Small Green Woodland Orchid

The small green woodland orchid (*Platanthera clavellata*) is know from only one location within the Chippewa National Forest in North-Central Minnesota. According to Welby Smith (1993), the preferred habitat for this orchid is "mostly in boreal-type sphagnum swamps and floating mats; usually associated with scattered, often stunted black spruce and tamarack." Several small black spruce and tamarack swamps were located within the project area. Such areas were searched thoroughly for the small green woodland orchid during the June 2002 surveys. No individuals or populations were found. Further, the coniferous swamp habitats along the proposed project area have been disturbed by past roadway construction and use, and, in most cases, were somewhat degraded. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Northern Bur-Reed

The northern bur-reed (*Sparganium glomeratum*) is known to occur within emergent wetlands and floating sedge mats in Northern Minnesota. Several small emergent wetlands occur along the proposed project corridor. All suitable habitats for the northern bur-reed within the project limits were searched during the June 2002 surveys, and no individuals or populations were found. Although individual plants may have not been detected, implementation of the proposed action may impact individuals or relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

American Awlwort

In Minnesota, *Subularia aquatica* is known to occur exclusively within shallow littoral zones of sandy, oligotrophic lakes. The only suitable habitat encountered within the proposed project area was the southern shore of North Twin Lake. However, during the June 2002 surveys, these sandy lakeshore and associated littoral habitats were searched extensively for the presence of rare flora and fauna, but no populations of American awlwort were detected. Implementation of the proposed action may impact individuals or relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Triangle Moonwort

Botrychium lanceolatum prefers northern hardwood forests habitats in northern Minnesota. Several tracts of maple/basswood forest and mixed coniferous/deciduous forest will be impacted along the proposed roadway corridor. Suitable habitats for all moonwort species were searched during the June 2002 surveys of the proposed right-of-way expansion area, and no triangle moonwort ferns were detected. Further, the forest habitats within 50 feet of the existing roadway centerline have been disturbed by past roadway construction and use, and do not represent high-

quality habitat for moonwort ferns. The greatest potential impact to the suitable habitats of the moonwort ferns is associated with the roadway realignment at the intersection of CSAH 22 and Forest Road 3213, east of North Twin Lake (see Figure 3-10). However, this forest habitat was surveyed extensively, and it appears to be a former pasture typified by compacted soils, poor soil development, which lacks leaf litter, all factors which impede the establishment and persistence of moonwort ferns.

Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Goblin Fern

Botrychium mormo prefers northern hardwood forests habitats in northern Minnesota. Several tracts of maple/basswood forest and mixed coniferous/deciduous forest will be impacted along the proposed roadway corridor. Suitable habitats for all moonwort species were searched during the June 2002 surveys of the proposed right-of-way expansion area. No goblin ferns were detected. Further, the forest habitats within 50 feet of the existing roadway centerline have been disturbed by past roadway construction and use, and do not represent high-quality habitat for goblin ferns. The greatest potential impact to the habitats of the goblin ferns is associated with the roadway realignment at the intersection of CSAH 22 and Forest Road 3213, east of North Twin Lake (see Figure 3-10). However, this forest habitat was surveyed extensively, and it appears to be a former pasture typified by compacted soils, poor soil development, and lacks leaf litter, which are all factors that impede the establishment and persistence of goblin ferns.

Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Lapland Buttercup

The lapland buttercup most commonly occurs on *sphagnum* hummocks located in cool conifer swamps. The species reproduces primarily from large trailing rhizomes and can form large colonies in favorable conditions (Coffin and Pfannmuller 1988). Two large tracts of white cedar swamp within the project study area provide suitable habitat for the species in basemap sections 5, 6, 21, 22, and 23 (see Figure 3-1). The conifer swamp edges within the proposed construction limits were searched extensively during the June 2002 surveys, and no Lapland buttercup plants were found. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

Ram's-Head Lady's Slipper

The ram's-head lady's slipper occurs within a wide range of forest types, including dry, sandy jack pine forests, coniferous forests with dense *Sphagnum* ground layers, and mixed coniferous-deciduous upland forests (Smith 1993). Suitable habitat within the proposed study area includes white cedar swamps and northern mesic hardwood forest uplands. However, the proposed construction may have little impact on interior forest habitat, and it is unlikely that the species occurs within the forest edges potentially affected by the proposed construction boundaries. Implementation of the proposed action may impact individuals or relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

White Adder's Mouth

The white adder's-mouth is known to occur within coniferous swamps and hardwood swamps with peat soil in northern Minnesota (Smith 1993). Many of the white cedar swamps and tamarack swamps found within the project study area provide suitable habitat for this species of orchid. Although those habitats were searched extensively during the June 2002 surveys, no such plants were found. Implementation of the proposed action may impact relatively small areas of potential habitat, but likely will not contribute to a trend towards federal listing or cause a loss of viability to the population or species.

5.0 RECOMMENDATIONS

As described in Section 4.0 of this report, Habitat Assessment and Potential Impacts, the roadway improvements proposed for the 10.8-kilometer (6.71-mile) section of CSAH 22 between CSAH 27 and CSAH 39, would result in some potential impacts on the state- and federally-listed threatened and endangered species, proposed species, and designated and proposed critical habitats of the species listed in Table 1-2. The following proposed recommendations focus on minimizing the potential for adverse impacts. Specifically, the recommendations address the potential impacts on the common snapping turtle, as well as reducing minor impacts on other species and natural communities:

- Install wide box-culverts in locations where the roadway right-of-way bisects perennial wetland systems (i.e. semi-permanently flooded and permanently flooded; Figure 3-1, sections 4, 5, 9, 10, 11, and 18 - 23) to reduce the mortality of snapping turtles, Blanding's turtle, and other migrating aquatic and terrestrial wildlife. Care should be taken in adjusting proper invert elevations for wider culverts, as to maintain or restore pre-construction hydrology and minimize impacts to the hydrologic regimes of upstream and downstream wetland systems.

- Conduct pre-construction mussel surveys in the vicinity of the Turtle River crossing (Figure 3-1, unmapped right-of-way between sections 3 and 4). If any sensitive species are located they will be removed and located in a similar habitat upstream from the construction site. Relocation activities should occur when water temperatures are moderate (not below 50 degrees or above 70 degrees Fahrenheit) so that heat stress may not result in unnecessary mussel mortality (Waller et. al. 1999).

- Install and maintain sediment basins and ensure that silt fences and hay bale barriers are installed prior to, or concurrent with, soil disturbing activities; installation should occur especially for those areas located adjacent to open water, stream crossings, and wetlands. Such devices would reduce the impacts of sedimentation within the open water or stream crossings and in the wetland systems. Further, erosion of sediments into coniferous swamps and other low-nutrient systems can increase pH and available nitrogen, which may contribute to the invasion and establishment of exotic species and result in dramatic changes in the structure of the vegetation in the wetland. Such alterations likely would impact suitable habitat (for example, coniferous swamps) of the lapland buttercup, white adder's-mouth, and ram's-head lady's slipper

- Minimize the width of the disturbance for the road construction to decrease the removal of large coniferous and deciduous trees adjacent to open water that could serve as roosts and nesting tress for the bald eagle and the red-shouldered hawk. Although engineering constraints may limit the ability to redirect or adjust the right-of-way alignment around large trees, it is recommended that the construction access roads and staging areas be located away from large trees and open water, whenever possible. Further, decadent trees and snags should be avoided where possible, as they provide potential habitat for black-

backed woodpeckers. It is recommended further that construction staging areas be located in areas of existing disturbed or low-quality vegetation (such as grassed areas or previously-cleared or managed areas), and avoid encroachment into wetlands or upland forests.

If any bald eagle nests are identified during implementation of the proposed roadway improvement, the FWS and the Forest Service will be notified and further construction activities will adhere to the Chippewa National Forest Land and Resources Management Plan, which has specific guidance for projects that occur within the vicinity of bald eagle nests. Note that neither the management plan nor the Northern States Bald Eagle Recovery Plan identifies standards, guidelines, or restrictions for activities occurring more than 402.34 meters (1,320 feet) from an eagle nest.

- Implement control measures for invasive plant species existing within roadside wetlands during roadway construction. Observations for invasive species should be performed during construction and control measures should be implemented to remove or control the spread of giant reed (*Phragmites australis*), reed canary grass (*Phalaris arundinacea*), and purple loosestrife (*Lythrum salicaria*). Both the giant reed and reed canary grass were observed in the study area, and the purple loosestrife was observed within close proximity (approximately five miles) of the proposed project area. It is recommended that invasive plant material be removed along existing road edges and swales immediately prior to or during roadway construction.

- Install guardrails in areas where the proposed roadway improvement encounters steep slopes rather than clearing and re-grading vegetated slopes.

- Re-vegetate disturbed areas with naturally occurring vegetation of similar composition and structure as the surrounding vegetation. Section 3.0 of this report, Observations Made Onsite, provides a list of suitable vegetation types by habitat.

- Mark proposed limits of disturbance for constructing the roadway improvements with tape or flagging to reduce the probability of inadvertent encroachment into intact native vegetation by construction machinery and personnel.

- Provide future construction schedule to the public to provide local citizens an opportunity to relocate species of showy lady's slipper orchids (*Cypripedium reginae*) to areas that will not be disturbed by the proposed roadway improvement project.

6.0 LIST OF PREPARERS

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7.0 REFERENCES

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APPENDIX A

CONSULTATION LETTERS AND COMMUNICATIONS

United States Department of the Interior, Fish and Wildlife Service, Response Letter to Mr. Jason Husveth, June 14, 2002

Minnesota Department of Natural Resources, Response Letter to Mr. Jason Husveth, June 12, 2002

Record of Communication between Stan Kot, U.S. Forest Service and Jason Husveth, June 28, 2002; and Forest Service Map of Threatened, Endangered, and Sensitive Species

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Twin Cities Field Office
4101 East 80th Street
Bloomington, Minnesota 55425-1665

JUN 14 2002

Mr. Jason J. Husveth
Senior Ecologist
Tetra Tech EM Incorporated
11300 Rupp Drive
Burnsville, Minnesota 55337

Dear Mr. Husveth:

This responds to your letter received on June 11, 2002, requesting information on threatened and endangered species for a proposed highway improvement project along CSAH 22/Federal Highway 22. The project site is located within the Chippewa National Forest and includes portions of Sections 25, 26, 31-36, T148N, R31W; Sections 5 and 6, T147N, R31W; Sections 30 and 31, T148N, R30W, Beltrami County, Minnesota.

Our data indicates that the following federally listed species and critical habitat may occur in the project area. The bald eagle (*Haliaeetus leucocephalus*), Canada lynx (*Lynx canadensis*) and gray wolf (*Canis lupus*) are listed as federally threatened in Minnesota and are known, or have the potential, to occur in Beltrami County. Designated critical habitat for the gray wolf includes all of Beltrami County.

Specific information available to us that may be helpful in project evaluation includes known bald eagle nest occurrences in T148N, R31W, Section 31 and T147N, R31W, Sections 3, 5 and 6. There appears to be substantial bald eagle use in vicinity of the North and South Twin Lakes areas.

We appreciate the opportunity to comment and look forward to working with you in the future. If you have questions regarding our comments, please contact me at (612) 725-3548, extension 201.

Sincerely,

Dan P. Stinnett
Field Supervisor

cc: Forest Supervisor, Chippewa National Forest

Minnesota Department of Natural Resources

Natural Heritage and Nongame Research Program, Box 25
500 Lafayette Road
St. Paul, Minnesota 55155-40__
Phone: (651) 296-7863 Fax: (651) 296-1811 E-mail: sarah.hoffmann@dnr.state.mn.us

June 12, 2002

Jason Husveth
Tetra Tech EM, Inc.
11300 Rupp Drive, Suite 100
Burnsville, MN 55337

Re: Request for Natural Heritage information for vicinity of proposed Federal Highway Administration Beltrami CSAH 22 Biological Assessment, T147N R31W Sections 3-6, T148N R31W Sections 25-27 & 31-36, T147N R32W Section 1, and T148N R32W Section 36, Beltrami County
NHNRP Contact #: ERDB 20021111

Dear Mr. Husveth,

The Minnesota Natural Heritage database has been reviewed to determine if any rare plant or animal species or other significant natural features are known to occur within an approximate one-mile radius of the area indicated on the map enclosed with your information request. Based on this review, there are 38 known occurrences of rare species or natural communities in the area searched (for details, see enclosed database printout and explanation of selected fields). If you need assistance determining whether a particular road improvement activity might impact any of these rare features, please contact me again.

The Natural Heritage database is maintained by the Natural Heritage and Nongame Research Program, a unit within the Division of Ecological Services, Department of Natural Resources. It is continually updated as new information becomes available, and is the most complete source of data on Minnesota's rare or otherwise significant species, natural communities, and other natural features. Its purpose is to foster better understanding and protection of these features.

Because our information is not based on a comprehensive inventory, there may be rare or otherwise significant natural features in the state that are not represented in the database. A county-by-county survey of rare natural features is now underway, but has not been completed for Beltrami County. Therefore ecologically significant features for which we have no records may exist on the project area.

The enclosed results of the database search are provided in two formats: index and full record. To control the release of locational information which might result in the damage or destruction of a rare element, both printout formats are copyrighted.

The index provides rare feature locations only to the nearest section, and may be reprinted, unaltered, in an Environmental Assessment Worksheet, municipal natural resource plan, or report compiled by your company for the project listed above. If you wish to reproduce the index for any other purpose, please contact me to request written permission. Copyright notice for the index should include the following disclaimer:

> "Copyright (year) State of Minnesota, Department of Natural Resources. This index may be reprinted, unaltered, in Environmental Assessment Worksheets, municipal natural resource plans, and internal reports. For any other use, written permission is required."

The full-record printout includes more detailed locational information, and is for your personal use only. If you wish to reprint the full-record printouts for any purpose, please contact me to request written permission.

Please be aware that review by the Natural Heritage and Nongame Research Program focuses only on *rare natural features*. It does not constitute review or approval by the Department of Natural Resources as a whole. If you require further information on the environmental review process for other wildlife-related issues, you may contact your Regional Environmental Assessment Ecologist, Paul Stolen, at (218) 755-4068.

An invoice for the work completed is enclosed. You are being billed for map and database search and staff scientist review. Please forward this invoice to your Accounts Payable Department. Thank you for consulting us on this matter, and for your interest in preserving Minnesota's rare natural resources.

Sincerely,

Sarah Hoffmann

Sarah D. Hoffmann
Endangered Species Environmental Review Coordinator

encl: Database search results
Rare Feature Database Print-Outs: An Explanation of Fields
Invoice

TWP	RNG	PRIMARY SECTION	FED STATUS	MN STATUS	S RANK	ELEMENT and OCCURRENCE NUMBER	MANAGED AREA
T147N	R31W	01	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #330	BUENA VISTA STATE FOREST
T147N	R31W	02		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #62	CHIPPEWA NATIONAL FOREST
T147N	R31W	02		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #65	CHIPPEWA NATIONAL FOREST
T147N	R31W	03	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1622	BUENA VISTA STATE FOREST
T147N	R31W	04		THR		BOTRYCHIUM LANCEOLATUM (TRIANGLE MOONWORT) #25	CHIPPEWA NATIONAL FOREST
T147N	R31W	04		NON		BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #116	BUENA VISTA STATE FOREST
T147N	R31W	04		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #61	CHIPPEWA NATIONAL FOREST
T147N	R31W	05		NON		BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #107	BUENA VISTA STATE FOREST
T147N	R31W	05		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #33	BUENA VISTA STATE FOREST
T147N	R31W	05		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #9003	
T147N	R31W	05	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #743	BUENA VISTA STATE FOREST
T147N	R31W	06		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #60	CHIPPEWA NATIONAL FOREST
T147N	R31W	06	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1951	BUENA VISTA STATE FOREST
T147N	R31W	07		NON		BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #167	BUENA VISTA STATE FOREST
T147N	R31W	07		NON		BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #228	BUENA VISTA STATE FOREST
T147N	R31W	07		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #35	BUENA VISTA STATE FOREST
T147N	R31W	07		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #135	BUENA VISTA STATE FOREST
T147N	R31W	08		SPC		BOTRYCHIUM MORMO (GOBLIN FERN) #34	BUENA VISTA STATE FOREST
T147N	R31W	08		SPC		BUTEO LINEATUS (RED-SHOULDERED HAWK) #241	CHIPPEWA NATIONAL FOREST
T147N	R31W	09		SPC		LASMIGONA COMPRESSA (CREEK HEELSPLITTER MUSSEL) #105	CHIPPEWA NATIONAL FOREST
T147N	R31W	09		SPC		LIGUMIA RECTA (BLACK SANDSHELL MUSSEL) #242	CHIPPEWA NATIONAL FOREST
T147N	R31W	1[illegible]		NON		BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #117	CHIPPEWA NATIONAL FOREST
T147N	R31W	1[illegible]		SPC		BUTEO LINEATUS (RED-SHOULDERED HAWK) #154	BUENA VISTA STATE FOREST
T147N	R32W	0[illegible]		THR		CYPRIPEDIUM ARIETINUM (RAM'S-HEAD LADY'S-SLIPPER) #30	BUENA VISTA STATE FOREST
T148N	R31W	23		THR		CYPRIPEDIUM ARIETINUM (RAM'S-HEAD LADY'S-SLIPPER) #47	BLACKDUCK STATE FOREST
T148N	R31W	23		SPC		MALAXIS MONOPHYLLOS VAR. BRACHYPODA (WHITE ADDER'S-MOUTH) #30	CHIPPEWA NATIONAL FOREST
T148N	R31W	27		SPC		RANUNCULUS LAPPONICUS (LAPLAND BUTTERCUP) #13	BLACKDUCK STATE FOREST
T148N	R31W	27			S4	WHITE CEDAR SWAMP #14	BLACKDUCK STATE FOREST
T148N	R31W	29		THR		CYPRIPEDIUM ARIETINUM (RAM'S-HEAD LADY'S-SLIPPER) #49	BLACKDUCK STATE FOREST
T148N	R31W	30		NON		BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #71	BLACKDUCK STATE FOREST
T148N	R31W	3[illegible]	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #322	BLACKDUCK STATE FOREST
T148N	R31W	3[illegible]		SPC		LASMIGONA COMPRESSA (CREEK HEELSPLITTER MUSSEL) #106	CHIPPEWA NATIONAL FOREST
T148N	R31W	3[illegible]		SPC		LIGUMIA RECTA (BLACK SANDSHELL MUSSEL) #158	CHIPPEWA NATIONAL FOREST
T148N	R31W	32		SPC		LASMIGONA COMPRESSA (CREEK HEELSPLITTER MUSSEL) #99	BLACKDUCK STATE FOREST
T148N	R31W	32		SPC		LIGUMIA RECTA (BLACK SANDSHELL MUSSEL) #241	BLACKDUCK STATE FOREST
T148N	R31W	35		NON		BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #108	BLACKDUCK STATE FOREST
T148N	R32W	25	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1861	BUENA VISTA STATE FOREST
T148N	R32W	36	LT	SPC		HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1862	BUENA VISTA STATE FOREST

RECORDS PRINTED = 38

T147N R31W SWNE01 BELTRAMI COUNTY, MN
Element: HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #330
State Status: SPECIAL CONCERN Federal Status: THREATENED
EO Size: EO Rank: Current Status: 6 Intended Status: 6
Site: SUGAR BUSH 1
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: USFS
NORTHERN BALD EAGLE. OCCURRENCE REPRESENTS ONE NEST. FIRST OBSERVED IN 1985, ACTIVE IN 1985 AND 1986.
Last Observed Date: 1995
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 45" Long: 94 33' 11"
Precision: within 0.25 mile, confirmed
Voucher: BE -C24BD Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W NWSE02 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #62
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 2
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST BUENA VISTA STATE FOREST
Source: CASTANEDA,W., GIESE,K. & TENNIS,J.(96KG015)
15+ PLANTS OBSERVED APPROXIMATELY 1/4 MILE SOUTH OF FR 2390A AND APPROX 1/4 MILE WEST OF FR 2390. PLANTS LOCATED IN COMPARTMENT 127, STAND 15, IN BLACKDUCK RANGER DISTRICT. HABITAT DOMINATED BY MAPLE, BASSWOOD, AND PAPER BIRCH. ASSOC SPP INCLUDE MAPLE SEEDLINGS, THALICTRUM DIOICUM, VIOLA SP, ARALIA NUDICALIS, FERNS, AND BOTRYCHIUM VIRGINIANUM.
Last Observed Date: 13 August 1996
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 32" Long: 94 34' 11"
Precision: within 0.25 mile, confirmed
Voucher: CNF Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W SESE02 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #65
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 2
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST BUENA VISTA STATE FOREST
Source: CASTANEDA,W. & GIESE,K.(SIGHT RECORD)
5 PLANTS OBSERVED IN COMPARTMENT 132, STAND 18 OF BLACKDUCK DISTRICT. HABITAT CONTAINS MAPLE-BASSWOOD AND ASPEN.
Last Observed Date: August 1995
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 18" Long: 94 34' 8"
Precision: within 0.25 mile, confirmed
Voucher: Verification: sight or sound rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W SWNE03 BELTRAMI COUNTY, MN
Element: HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1622
State Status: SPECIAL CONCERN Federal Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 3
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: USFS
NESTING AREA. SOUTH TWIN II.
Last Observed Date: 1996
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 43" Long: 94 35' 48"
Precision: within 0.25 mile, confirmed
Voucher: BE -C57BD Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W NENW04 BELTRAMI COUNTY MN
Element: BOTRYCHIUM LANCEOLATUM (TRIANGLE MOONWORT) #25
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 4
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST BUENA VISTA STATE FOREST
Source: GIESE,K. & CASTANEDA,W.(PHOTO RECORD)
Last Observed Date: 07 August 1996
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 56" Long: 94 37' 25"
Precision: within 0.25 mile, confirmed
Voucher: Verification: photo rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
PLANT FOUND IN COMPARTMENT 87, STAND 13 OF BLACKDUCK DISTRICT. LOCATED IN NORTH-ERN HARDWOODS WITH SUGAR MAPLE-BASSWOOD. PHOTO TAKEN BY STEVE MORTENSEN (08/96).

T147N R31W NENW04 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #116
State Status: No Legal Status
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 4
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST LEECH LAKE RESERVATION CHIPPEWA NATIONAL FOREST
Source: MORTENSEN,S.(LL1477)
Last Observed Date: August 1997
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 56" Long: 94 37' 25"
Precision: within 0.25 mile, confirmed
Voucher: LLDRM Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
1997: LOCATED IN NORTHERN HARDWOOD FOREST. (PREV COLL: CASTANEDA,W. & GIESE,K. (96KG009), MIN. 8/7/96). 50+ PLANTS OBSERVED THROUGHOUT COMPARTMENT 87, STAND 13, BLACKDUCK DISTRICT. LOCATED IN SUGAR MAPLE-BASSWOOD HABITAT WITH SOME IRONWOOD. ASSOCATED SPECIES: ACER SEEDLINGS, ARALIA NUDICAULIS, CAREX SP, THALICTRUM DIOICUM, HEPATICA AMERICANA, VIOLA SP, B. VIRGINIANUM, OSMORHIZA CLAYTONI.

T147N R31W NENW04 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #61
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 4
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST BUENA VISTA STATE FOREST
Source: CASTANEDA,W. & GIESE,K.(96KG010)
Last Observed Date: 07 August 1996
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 56" Long: 94 37' 25"
Precision: within 0.25 mile, confirmed
Voucher: CNF Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
90+ PLANTS LOCATED THROUGHOUT COMPARTMENT 87, STAND 13 IN BLACKDUCK RANGER DISTRICT (MOSTLY IN LOW AREAS). HABITAT DOMINATED BY SUGAR, MAPLE-BASSWOOD WITH SOME IRONWOOD. ASSOCIATED SPECIES INCLUDE ACER SEEDLINGS, ARALIA NUDICALIS, CAREX SP, THALICTRUM DIOICUM, HEPATICA AMERICANA, VIOLA SP, BOTRYCHIUM VIRGINIANUM AND OSMORHIZA CLAYTONI.

T147N R31W SWSW05 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #107
State Status: No Legal Status
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 5
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: ESTES-MORTENSEN,C.(SIGHT RECORD)
Last Observed Date: 03 June 1995
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 18" Long: 94 38' 57"
Precision: within 0.25 mile, confirmed
Voucher: Verification: sight or sound rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
COMP 88 STAND 38 OF BLACKDUCK DISTRICT. SLIGHT DEPRESSION & CANOPY OPENING 170 FT EAST OF EDGE OF FR 2393, 2.3 MI NO CO RD 20; .5 MI SOUTH FR 2396. LOOP AT END OF 2393. ASH/CONIFER IN IMMEDIATE AREA. B. MATRICARIIFOLIUM SURROUNDED BY B. MULTIFIDUM. CNF TES #1013.

T147N R31W SE32SW05 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #33
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 5
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: GALLAGHER,J.(JSFS); ESTES,C.(LEECH LAKE RESERVATION)(94090201)
Last Observed Date: 11 September 1994
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 17" Long: 94 38' 32"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
COMPARTMENT 88 STAND 38: MORE THAN 50 PLANTS LOCATED WITHIN NORTHERN HARDWOOD STAND, SEVERAL AGE CLASSES REPRESENTED FROM 20 YR OLD MAPLE THRU ABOUT 90 YR OLD MAPLE & WHITE CEDAR. CLOSED CANOPY, THICK LEAF MOLD. SURVEY PLOT PLACED ON 9/11 94 BY CINDY JOHNSON-GROH, DON FARRAR. ANOTHER OCCURRENCE OF THIS SPECIES IS FOUND IN ANOTHER "40" WITHIN THIS STAND. POPULATION EXTENDS INTO SECTION 8. FOREST SERVICE DATABASE OCCURRENCE #1006.

T147N R31W SE5W05 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #9003
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: site not named or no record
Ownership: Owner unknown
Managed Area(s): not managed or no record
Source: BARROTT,J., SHADIS,D. & GALLAGHER,J.(94090201)
Last Observed Date: 02 September 1994
Quad Map:
Latitude: 0 0' 0" Long: 0 0' 0"
Precision: within 0.25 mile, confirmed
Voucher: 513651 MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
LOCATED EAST OF MEADOW LAKE, IN COMPARTMENT 88, STAND 38, BLACKDUCK DISTRICT.

T147N R31W NESE05 BELTRAMI COUNTY, MN
Element: HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #743
State Status: SPECIAL CONCERN Federal Status: THREATENED
EO Size: EO Rank: Current Status: 6 Intended Status: 6
Site: SUGAR BUSH 5
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: USFS
Last Observed Date: 1995
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 31" Long: 94 37' 60"
Precision: within 0.25 mile, confirmed
Voucher: BE -C98BD Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
NESTING AREA.

T147N R31W NWNE06 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #60
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 6
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST BLACKDUCK STATE FOREST
Source: CASTANEDA,W., GIESE,K. & TENNIS,J.(96KG011)
Last Observed Date: 13 August 1996
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 57" Long: 94 39' 32"
Precision: within 0.25 mile, confirmed
Voucher: CNF Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
15+ PLANTS LOCATED IN CENTER OF COMPARTMENT 89, STAND 23, IN BLACKDUCK RANGER DISTRICT. HABIT DOMINATED BY ASPEN, MAPLE, BASSWOOD, AND BALSAM FIR. ASSOCIATED SPECIES INCLUDES HAZEL, MAPLE SEEDLINGS, VIOLA SP, TWISTED STALK, THALICTRUM DIOICUM, CAREX SP AND HEPATICA AMERICANA. 2 PLANTS OBSERVED ON INITIAL VISIT IN JULY.

T147N R31W SENW06 BELTRAMI COUNTY, MN
Element: HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1951
State Status: SPECIAL CONCERN Federal Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 6
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: COLE,M.(USFS)
NESTING AREA. MEADOW LAKE.
Last Observed Date: 2000
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 44" Long: 94 39' 48"
Precision: within 0.25 mile, confirmed
Voucher: BE -C137BD Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W SW07 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #167
State Status: No Legal Status
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 7
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: ESTES-MORTENSEN,C.(LL0611)
LOCATED IN MEADOW LAKE AREA, COMPARTMENT 129, STAND 19. TRANSITION AREA BETWEEN UPLAND HARDWOOD FOREST & SMALL WETLAND WITH FRAXINUS AND CAREX. 12 OR MORE STEMS OBSERVED ON SLIGHT SLOPE TO WETLAND; OFTEN 2 OR MORE STEMS ARISING FROM SAME SPOT. (VERIFIED BY W.H. WAGNER 10/97).
Last Observed Date: 05 August 1994
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 33' 33" Long: 94 39' 57"
Precision: within 0.25 mile, confirmed
Voucher: LLDRM Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W NWSE07 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #228
State Status: No Legal Status
EO Size: EO Rank: Current Status: Intended Status:
Site: BUSH 7
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: MAXSON,G.(GM99002)
PLANTS LOCATED IN A MATURE MAPLE-BASSWOOD STAND WITH 2-3 CM DUFF LAYER. B. MCRMO ALSO FOUND AT SITE. STAND #129/19. 1 DUP, #GM99003.
Last Observed Date: 16 September 1999
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 33' 36" Long: 94 39' 36"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W SWNENW07 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MCRMO (GOBLIN FERN) #35
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 7
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: GALLAGHER,J.(USFS) & ESTES,C.(LEECH LAKE RES)(94081701)
COMPARTMENT 129 STAND 21: TWO PLANTS OBSERVED IN MIXED NORTHERN HARDWOODS WITH WHITE SPRUCE, WHITE PINE, AND BALSAM FIR, STRONG ASPEN COMPONENT. MAPLE OVERSTORY WHERE GOBLIN FERNS WERE LOCATED. HEPATICA, UVULARIA, LEATHERWOOD, BEAKED HAZEL ON THE GROUND & UNDERSTORY. REGENERATING CLEARCUT (APPROX 10 YEARS OLD) APPROX 120 FEET TO THE SOUTH. CHIPPEWA NF TES #1004. 1 PLANT COLLECTED. (VERIFIED BY W.H. WAGNER 10/97).
Last Observed Date: 17 August 1994
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 1" Long: 94 39' 54"
Precision: within 0.25 mile, confirmed
Voucher: 508245 MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111

T147N R31W NWSE07 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #135
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: BUSH 7
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: STEBBINS,S.(998S011)
Last Observed Date: 16 September 1999
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 33' 36" Long: 94 39' 36"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
TWO PLANTS LOCATED IN MAPLE-BASSWOOD FOREST IN A NARROW CORRIDOR BETWEEN A LOGGING ROAD & CLEARCUT. IN 2-3CM DUFF WITH ACER SACCHARUM SEEDLINGS, UVULARIA GRANDIFLORA, STREPTOPUS ROSEUS, OSMORHIZA CLAYTONII, THALICTRUM DIOICUM, OSTRYA VIRGINIANA, BOTRYCHIUM MATRICARIIFOLIUM. STAND BD 129/19. PHOTO ALSO TAKEN AT SITE BY G. MAXSON. CNF TES #1041.

T147N R31W NENW08 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MORMO (GOBLIN FERN) #34
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 8
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: ESTES,C.; JOHNSON-GROH,C.(LL0614)
Last Observed Date: 1998
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 4" Long: 94 38' 27"
Precision: within 0.25 mile, confirmed
Voucher: 87918 MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
1994: MEADOW LAKE AREA. PART OF CHIPPEWA NF CAND OLD-GROWTH COMPLEX. BLACKDUCK RD, COMP 88 STND 38: 1+ PLANTS FOUND BY ESTES AT LOCATION UNDER MIXED NORTHERN HARDWOODS. CHIPPEWA NF TES #1005. (VERIFIED BY WAGNER 1998). 1 DUP AT LEECH LAKE HERBARIUM. MONITORING PLOT #3 ESTABLISHED BY JOHNSON-GROH, 24 PLANTS OBSERVED. 1995: 14 PLANTS OBS. 1996: 104 PLANTS OBS. 1997 & 1998: POPULATION STEADILY DECREASED; INTODUCED EARTHWORMS MAY BE ALTERING SOIL & IMPACTING BOTRYCHIUMS.

T147N R31W NWNWNW08 BELTRAMI COUNTY, MN
Element: BUTEO LINEATUS (RED-SHOULDERED HAWK) #241
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 8
Ownership: Owner unknown
Managed Area(s): CHIPPEWA NATIONAL FOREST BUENA VISTA STATE FOREST
Source: MCLEOD,M.A. (1994 RED-SHOULDERED HAWK BREEDING SURVEY)
Last Observed Date: 17 May 1995
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 9" Long: 94 38' 57"
Precision: within 0.25 mile, confirmed
Voucher: Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
POSITIVE NESTING. ONE NEST FOUND IN MAY; NEST FAILED IN EARLY JUNE.

T147N R31W SWNW09 BELTRAMI COUNTY, MN
Element: LASMIGONA COMPRESSA (CREEK HEELSPLITTER MUSSEL) #105
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 9
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST
Source: HEALY, B. AND HOVE, M.
Last Observed Date: 30 August 2000
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 33' 56" Long: 94 37' 37"
Precision: within 0.25 mile, confirmed
Voucher: JFHM Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
HABITAT: TURTLE RIVER, VARIETY OF SUBSTRAES, MUCH COVERED WITH GREEN ALGAE, MACROPHYTES COMMON. ASSOCIATED SPECIES: LIGUMIA RECTA, LAMPSILIS SILIQUCIDEA, LAMPSILIS CARDIUM. CHIPPEWA NF TES# LACO 1002

T147N R31W SWNW09 BELTRAMI COUNTY, MN
Element: LIGUMIA RECTA (BLACK SANDSHELL MUSSEL) #242
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 9
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST
Source: HEALY, B. AND HOVE, M.
Last Observed Date: 30 August 2000
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 33' 56" Long: 94 37' 37"
Precision: within 0.25 mile, confirmed
Voucher: JFBM Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
1 SPECIMEN FOUND IN TURTLE RIVER. MANY MACROPHYTES AND A MIX OF SUBSTRATES. ASSOCIATED SPECIES INCLUDE LASMIGONA COMPRESSA, LAMPSILIS SILIQUOIDEA, LAMPSILIS CARDIUM. CHIPPEWA NF TES #LIRE1003

T147N R31W SENW11 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #117
State Status: No Legal Status
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 11
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST BUENA VISTA STATE FOREST
Source: CASTANEDA,W. & GIESE,K.(96KG008)
Last Observed Date: 05 August 1996
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 33' 54" Long: 94 34' 50"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
8 PLANTS OBSERVED IN BLACKDUCK DISTRICT, COMPARTMENT 132, STAND 37. HABITAT DOMINATED BY ASPEN.

T147N R31W NENW11 BELTRAMI COUNTY, MN
Element: BUTEO LINEATUS (RED-SHOULDERED HAWK) #164
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: SUGAR BUSH 11
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST CHIPPEWA NATIONAL FOREST
Source: STUCKER,S. AND S.PRESLEY (CO BIOL SURVEY 1994)
Last Observed Date: 12 May 1994
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 34' 4" Long: 94 34' 44"
Precision: within 0.25 mile, confirmed
Voucher: Verification: inferred breeding
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
INFERRED BREEDING. ONE BIRD HEARD DURING PLAYBACK SURVEY. BIRD CALLED VIGOROUSLY IN RESPONSE TO PLAYBACK OF CONSPECIFIC CALLS, APPROACHING TO WITHIN 150 METERS OF OBSERVERS. HABITAT WAS MATURE MAPLE-BASSWOOD FOREST ON SLOPE, GRADING INTO LOWLAND ASH SWAMP WITH A FEW TAMARACKS. PINE PLANTATION NEARBY. TIME OF OBSERVATION WAS 1230 HRS.

T147N R32W 0WNESE01 BELTRAMI COUNTY, MN
Element: CYPRIPEDIUM ARIETINUM (RAM'S-HEAD LADY'S-SLIPPER) #30
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: ROADSIDE LAKE ORCHID BOG
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST
Source: MORTENSEN,S.(PHOTO RECORD)
Last Observed Date: 1997
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 34' 34" Long: 94 40' 25"
Precision: within 0.25 mile, confirmed
Voucher: Verification: photo rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 111
1992: 250 FLOWERING PLANTS BETWEEN CO RD 27 & SW SHORE OF ROADSIDE LAKE UNDER THUJA OCCID, ABIES BAL & SCATT BETULA PAPY. OTHER SITES SURVEYED, NO PLANTS FOUND. 1996: 303 FLOWERING STEMS & 387 NON-FLOWERING, MANY SEEDLINGS. ASSOC SPP: CORALLOR TRIF, CYPRIP ACAULE, C.CALC, C.REG, LISTERA CORD, PLATAN HYP, P.OBTUS, CLINT BOR, ARALIA NUD, ASTER MAC, TRIENT BOR, COPTIS GROEN, MITELLA NUD, MONESES UNI, PTERID AQUIL. 1997 BRIEF SITE CHECK, OBS FEWER PLANTS THAN IN PREV YEARS.

T148N R31W NESE23 BELTRAMI COUNTY, MN
Element: CYPRIPEDIUM ARIETINUM (RAM'S-HEAD LADY'S-SLIPPER) #47
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: DRURY LAKE BOG
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: ESTES-MORTENSEN,C. AND MORTENSEN,S. (SIGHT RECORD)
Last Observed Date: June 1995
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 37' 9" Long: 94 34' 12"
Precision: within 0.25 mile, confirmed
Voucher: Verification: sight or sound rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
APPROX 1 MILE NE OF DRURY LAKE AT END OF FR 2417 IN COMP 77, STAND 21 (MIXED LOWLAND CONIFER). 1992: ORCHID BOG FOUND BY C. ESTES & S. MORTENSEN; NO C.ARIET IDENTIFIED. 1993: 6 POSSIBLE C.ARIET STEMS FOUND BY ESTES IN JULY IN 2 SPOTS APPROX 100 FT APART. 1994: PRESENCE OF C.ARIET UNCOMFIRMED BY ESTES. 1995: 2 STEMS CONFIRMED BY ESTES. ASSOC SPP: MALAXIS MONO VAR BRACH, M.UNIFOLIA, GOODYERA REP, PLATANTHERA HYPER, CYPRIPEDIUM CALCEOLUS & C.REGINAE.

T148N R31W NESE23 BELTRAMI COUNTY, MN
Element: MALAXIS MONOPHYLLOS VAR. BRACHYPODA (WHITE ADDER'S-MOUTH) #30
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 23
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): CHIPPEWA NATIONAL FOREST BLACKDUCK STATE FOREST
Source: ESTES,C.(SIGHT RECORD)
Last Observed Date: July 1993
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 37' 9" Long: 94 34' 12"
Precision: within 0.25 mile, confirmed
Voucher: Verification: sight or sound rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
COMP 77, STAND 21 OF THE BLACKDUCK DISTRICT. CHIPPEWA NF TES #1001.

T148N R31W SESE27 BELTRAMI COUNTY, MN
Element: RANUNCULUS LAPPONICUS (LAPLAND BUTTERCUP) #13
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 27
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: ESTES,C.(LEECH LAKE RESERVATION)(LL0547)
Last Observed Date: 1997
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 36' 6" Long: 94 35' 23"
Precision: within 0.25 mile, confirmed
Voucher: MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
1994: COLL IN GILFILLAN AREA NE OF N TWIN LK. BLACKDUCK RD, COMP 88, STD 18. IN RAVINE IN CEDAR SWAMP W OF FR 2913. W/RUBUS PUB, CCPTIS GROEN, MITELLA NUDA, MONESES UNI, GYMNOCARPIUM DRY. (PREV COLL: SATHER,N. SE27,1991. SEV PATCHES IN TRANS ZONE SW EDGE OF BOG WHERE STEEP HILL BREAKS INTO SWAMP; MNIUM ON DECAYING LOG, W/TRIENTALIS; FEWER PLANTS IN SPHAG AREA E OF TAMARACKS.) 1995: ESTES SAW TIP-UP IN SW PATCH, MAY IMPACT PLANTS. 1997: SITE FLOODED PART OF GROWING SEASON

T148N R31W SE27 BELTRAMI COUNTY, MN
Element: WHITE CEDAR SWAMP #14
S Rank: S4
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 27
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: SATHER,N.P.
Last Observed Date: 31 May 1991
Quad Map: PIMUSHE LAKE (H11D)
Latitude: 47 36' 6" Long: 94 35' 23"
Precision: approx. boundaries have been determined
Voucher: Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
SMALL CEDAR SWAMP WITH OPEN CANOPY, OCCASIONAL LARIX LARICINA, OPEN, WET FOREST FLOOR WITH VERY LITTLE SHRUB DEVELOPMENT, SPHAGNUM DOMINATED, FEW FORBS. SMALL SWAMP DEVELOPED AT BASE OF STEEP SLOPE, NORTH OF NORTH TWIN LAKE, JUST WEST OF FOREST ROAD 2213.

T148N R31W NWNE29 BELTRAMI COUNTY, MN
Element: CYPRIPEDIUM ARIETINUM (RAM'S-HEAD LADY'S-SLIPPER) #49
State Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 29
Ownership: County (Tax Forfeit)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: ESTES,C. (SIGHT RECORD)
Last Observed Date: 17 June 1994
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 36' 43" Long: 94 38' 21"
Precision: within 0.25 mile, confirmed
Voucher: Verification: sight or sound rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
1994: PRESENCE OF 8 STEMS VERIFIED DURING SITE VISIT. 1993: 4 PLANTS IN A CLUMP LOCATED 0.25 MILE NE OF GULL LAKE BY P. STRONG & N. SATHER. ON SPRING LAKE PENNINGTON MORAINE.

T148N R31W NENE30 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #71
State Status: No Legal Status
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 30
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: GALLAGHER,J. (USFS)(94090601)
Last Observed Date: 06 September 1994
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 36' 43" Long: 94 39' 12"
Precision: within 0.25 mile, confirmed
Voucher: 514927 MIN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
COMPARTMENT 81 STAND 5: NORTHWEST OF GULL LAKE, ASPEN STAND WITH NORTHERN HARDWOOD COMPONENT. WELL DEVELOPED SHRUB LAYER IN PLACES, OTHER AREAS SEEMED MORE SUITABLE FOR B. MORMO WITH ABSENCE OF GROUND VEGETATION AND LEAF MOLD. ONE PLANT FOUND. (VERIFIED BY W.H. WAGNER 10/97).

T148N R31W SWNE31 BELTRAMI COUNTY, MN
Element: HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #322
State Status: SPECIAL CONCERN Federal Status: THREATENED
EO Size: EO Rank: Current Status: 6 Intended Status: 6
Site: TAYLOR 31
Ownership: County (Tax Forfeit)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: USFS
Last Observed Date: 1995
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 35' 35" Long: 94 39' 32"
Precision: within 0.25 mile, confirmed
Voucher: BE -C07BD Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
NORTHERN BALD EAGLE. OCCURRENCE REPRESENTS ONE NEST WHICH WAS FIRST OBSERVED IN 1969. ACTIVE 1979-1986.

T148N R31W NESW31 BELTRAMI COUNTY, MN
Element: LASMIGONA COMPRESSA (CREEK HEELSPLITTER MUSSEL) #106
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 31
Ownership: Owner unknown
Managed Area(s): CHIPPEWA NATIONAL FOREST BLACKDUCK STATE FOREST
Source: COOK, C.; HOVE, M.; GILLES, L.; PAULSON, K.
Last Observed Date: 15 August 2000
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 35' 25" Long: 94 39' 57"
Precision: within 0.25 mile, confirmed
Voucher: JFBN Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
NICE MIX OF COARSE SUBSTATES IN TURTLE RIVER NEAR COUNTY ROAD 307 BRIDGE. 7 INDIVIDUALS. ASSOCIATED SPECIES INCLUDE ANODONTOIDES FERUSSACIANUS, LAMPSILIS SILIQUOIDEA, PYGANONDON GRANDIS UTTERBECHIA IMBECILIS, LAMPSILIS CARDIUM. CHIPPEWA TES#: LACO1003

T148N R31W NESW31 BELTRAMI COUNTY, MN
Element: LIGUMIA RECTA (BLACK SANDSHELL MUSSEL) #158
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 31
Ownership: Owner unknown
Managed Area(s): CHIPPEWA NATIONAL FOREST BLACKDUCK STATE FOREST
Source: COOK,C., HOVE,M., GILLES,L., & PAULSON,K.
Last Observed Date: 15 August 2000
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 35' 25" Long: 94 39' 57"
Precision: within 0.25 mile, confirmed
Voucher: JFBM Verification: verified
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
2000: 9 SPECIMENS COLL IN TURTLE RIVER, NEAR CO RD 307 BRIDGE. HABITAT WAS NICE MIX OF COARSE SUBSTRATES. ASSOC SPP: LASMIGONA COMP, LAMPSILIS SIL, L. CARD, ANODONTOIDES FERUS, PYGANODON GRAND, UTTERBACKIA IMB. CNF TES #LIRE 1004. 1996: ONE FULL SET OF VALVES IN COLLECTION @ BELL MUSEUM (#7713 JFBM). 2 LIVE INDIV OBSERVED BY HOVE, COOK, ALLISON & BUTLER. SURVEYED EDGE OF POOL DOWNSTREAM OF CO 307 BRIDGE. 1.25 HRS SPENT SEARCHING. CNF TES #1001.

T148N R31W SWSW32 BELTRAMI COUNTY, MN
Element: LASMIGONA COMPRESSA (CREEK HEELSPLITTER MUSSEL) #99
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 32
Ownership: MN DNR Forestry (State Forest and Con-Con Land)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: HOVE, M.
Last Observed Date: 24 August 1999
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 35' 11" Long: 94 38' 53"
Precision: within 0.25 mile, confirmed
Voucher: Verification:
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
TURTLE RIVER, VERY SOFT SUBSTRATE; 1 DEAD INDIVIDUAL. CNF #1001

T148N R31W SWSW32 BELTRAMI COUNTY, MN
Element: LIGUMIA RECTA (BLACK SANDSHELL MUSSEL) #241
State Status: SPECIAL CONCERN
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 32
Ownership: State of Minnesota (Other)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: HOVE, M.
Last Observed Date: 24 August 1999
Quad Map: TURTLE RIVER LAKE (H11C)
Latitude: 47 35' 11" Long: 94 38' 53"
Precision: within 0.25 mile, confirmed
Voucher: Verification:
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
TURTLE RIVER, 80M UPSTREAM AND 20M DOWNSTREAM OF COUNTY ROAD 22 BRIDGE, VERY SOFT SUBSTRATE; 8 DEAD INDIVIDUALS.
CNF #1002

T148N R31W SWSE35 BELTRAMI COUNTY, MN
Element: BOTRYCHIUM MATRICARIIFOLIUM (MATRICARY GRAPEFERN) #108
State Status: No Legal Status
EO Size: EO Rank: Current Status: Intended Status:
Site: TAYLOR 35
Ownership: U.S. Forest Service (National Forest)
Managed Area(s): BLACKDUCK STATE FOREST CHIPPEWA NATIONAL FOREST
Source: GIESE,K. & CASTANEDA,W.(SIGHT RECORD)
Last Observed Date: 06 August 1996
Quad Map: HIMUSHE LAKE (H11D)
Latitude: 47 35' 9" Long: 94 34' 29"
Precision: within 0.25 mile, confirmed
Voucher: Verification: sight or sound rec.
DNR Region: 1
Wildlife Area: 120
Forestry District: 117
COMPARTMENT 85 STAND 29 OF BLACKDUCK DIST. PAPER BIRCH, MAPLE, BASSWOOD. 1-3 INCH LEAF LITTER.

T148N R32W SWSW25 BELTRAMI COUNTY, MN
Element: HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1861
State Status: SPECIAL CONCERN Federal Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: PORT HOPE 25
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST
Source: LENNING,B.(DNR)
NESTING AREA. PETERSON LAKE.

Last Observed Date: 2000
DNR Region: 1
Wildlife Area: 120
Quad Map: TURTLE RIVER LAKE (H11C)
Forestry District: 111
Latitude: 47 36' 3" Long: 94 41' 29"
Precision: within 0.25 mile, confirmed

Voucher: BE -053 Verification: verified

T148N R32W NWSE36 BELTRAMI COUNTY, MN
Element: HALIAEETUS LEUCOCEPHALUS (BALD EAGLE) #1862
State Status: SPECIAL CONCERN Federal Status: THREATENED
EO Size: EO Rank: Current Status: Intended Status:
Site: PORT HOPE 36
Ownership: Owner unknown
Managed Area(s): BUENA VISTA STATE FOREST
Source: LENNING,B.(DNR)
NESTING AREA. PORTE HOPE.

Last Observed Date: 2000
DNR Region: 1
Wildlife Area: 120
Quad Map: TURTLE RIVER LAKE (H11C)
Forestry District: 111
Latitude: 47 35' 15" Long: 94 40' 46"
Precision: within 0.25 mile, confirmed

Voucher: BE -052 Verification: verified

Rare Features Database Print-outs: An Explanation of Fields

The Rare Features database is part of the Natural Heritage Information System,
and is maintained by the Natural Heritage and Nongame Research Program,
a unit within the Section of Ecological Services,
Minnesota Department of Natural Resources (DNR).

Field Name: [Full (non-abreviated) field name, if different]. Further explanation of field.

-C-

CBS Site: [County Biological Survey site number]. In each county, the numbering system begins with 1.

CLASS: A code which classifies features by broad taxonomic group: NC = natural community; SA = special animal; SP = special plant; GP = geologic process; GT = geologic time; OT = other (e.g. colonial waterbird colonies, bat hibernacula).

Cty: [County]. Minnesota counties (ordered alphabetically) are numbered from 1 (Aitkin) to 87 (Yellow Medicine).

CURRENT STATUS: Present protection status, from 0 (owner is not aware of record) to 9 (dedicated as a Scientific and Natural Area).

-D-

DNR Region: 1=NW, 2=NE, 3=E Central, 4=SW, 5=SE, 6= Minneapolis/St. Paul Metro.

DNR Quad: [DNR Quadrangle code]. DNR-assigned code of the U.S. Geologic Survey topographic map on which the rare feature occurs.

-E-

ELEMENT or Element: See "Element Name (Common Name)"

Element Name (Common Name): The name of the rare feature. For plant and animal species records, this field holds the scientific name, followed by the common name in parentheses; for all other elements (such as plant communities, which have no scientific name) it is solely the element name.

EO RANK: [Element Occurrence Rank]. An evaluation of the quality and condition of natural communities from A (highest) to D (lowest).

EO Size: [Element Occurrence Size]. The size in acres (often estimated) of natural communities.

-F-

FED STATUS: [Federal Status]. Status of species under the Federal Endangered Species Law: LE=endangered, LT=threatened, C=species which have been proposed for federal listing.

Federal Status: See "FED STATUS"

Forestry District: The Minnesota DNR's Division of Forestry district number.

-G-

GLOBAL RANK: The abundance of an element globally, from G1 (critically imperiled due to extreme rarity on a world-wide basis) to G5 (demonstrably secure, though perhaps rare in parts of its range). Global ranks are determined by the Conservation Science Division of The Nature Conservancy.

-I-

INTENDED STATUS: Desired protection status. See also "CURRENT STATUS." If a complete list of protection status codes is needed, please contact the Natural Heritage Program.

-L-

LAST OBSERVED or Last Observed Date or Last Observation: Date of the most recent record of the element at the location.

Latitude: The location at which the occurrence is mapped on Natural Heritage Program maps. NOTE: There are various levels of precision in the original information, but this is not reflected in the latitude/longitude data. For some of the data, particularly historical records, it was not possible to determine exactly where the original observation was made (e.g. "Fort Snelling", or "the south shore of Lake Owasso"). Thus the latitude/longitude reflect the mapped location, and not necessarily the observation location.

Legal: Township, range and section numbers.

Long: [Longitude]. See NOTE under "Latitude"

-M-

MANAGED AREA or Managed Area(s): Name of the federally, state, locally, or privately managed park, forest, preserve, etc., containing the occurrence, if any. If this field is blank, the element probably occurs on private land. If "(STATUTORY BOUNDARY)" occurs after the name of a managed area, the location may be a private inholding within the statutory boundary of a state forest or park.

Map Sym: [Map Symbol].

MN STATUS: [Minnesota Status]. Legal status of plant and animal species under the Minnesota endangered species law:

END=endangered, THR=threatened, SPC=special concern, NON= no legal status, but rare and may become listed if declines continue. This field is blank for natural communities and colonial waterbird nesting sites, which have no legal status in Minnesota, but are tracked by the database.

-N-

NC Rank: [Natural Community Rank].

-O-

Occ #: [Occurrence Number]. The occurrence number, in combination with the element name, uniquely identifies each record.

OCCURRENCE NUMBER: See "Occ #"

OF OCCURS: The number of records existent in the database for each element within the area searched.

Ownership: Indicates whether the site is publicly or privately owned; for publicly owned land, the agency with management responsibility is listed.

-P-

Precision: Precision of locational information of occurrence: C (confirmed) = known within 1/4 mile radius, U (unconfirmed) = known within 1/2 mile, N (non-specific) = known within 1 mile, G (general) = occurs within the general region, X (unmappable)=location is unmappable on USGS topographic quadrangles (often known only to the nearest county), O (obscure/gone)=element no longer exists at the location.

PS: [Primary Section]. The section containing all or the greatest part of the occurrence.

-Q-

Quad Map: See "DNR Quad"

-R-

Rec #: [Record number].

RNG or Rng: [Range number].

-S-

SECTION or Section: [Section number(s)]. Some records are given only to the nearest section (s), but most are given to the nearest quarter-section or quarter-quarter-section (e.g., SWNW32 denotes the SW1/4 of the NW1/4 of section 32). A "0" is used as a place holder when a half-section is specified (e.g., 0N03 refers to the north 1/2 of section 3). When a occurrence crosses section boundaries, both sections are listed, without punctuation (e.g., the NE1/4 of section 19 and NW1/4 of section 20 is displayed as "NE19NW20").

Site: A name which refers to the geographic area within which the occurrence lies. If no name for the area exists (a locally used name, for example), one is assigned by the County Biological Survey or the Natural Heritage Program.

Source: The collector or observer of the rare feature occurrence.

S RANK: [State Rank]. A rank assigned to the natural community type which reflects the known extent and condition of that community in Minnesota. Ranks range from 1 (in greatest need of conservation action in the state) to 5 (secure under present conditions). A "?" following a rank indicates little information is available to rank the community. Communities for which information is especially scarce are given a "U", for "rank undetermined". The ranks do not represent a legal status. They are used by the Minnesota Department of Natural Resources to set priorities for research, inventory and conservation planning. The state ranks are updated as inventory information becomes available.

State Status: See "MN STATUS"

-T-

TWP or Twp: [Township number].

-V-

Verification: A reflection of the reliability of the information on which the record is based. The highest level of reliability is "verified," which usually indicates a collection was made or, in the case of bird records, nesting was observed. Plant records based on collections made before 1970 are unverified.

Voucher: The museum or herbarium where specimens are maintained, and the accession number assigned by the repository. In the case of bald eagles, this is the breeding area number.

-W-

Wildlife Area: The Minnesota DNR's Section of Wildlife administrative number.

Data Security

Locations of some rare features must be treated as sensitive information because widespread knowledge of these locations could result in harm to the rare features. For example, wildflowers such as orchids and economically valuable plants such as ginseng are vulnerable to exploitation by collectors; other species, such as bald eagles, are sensitive to disturbance by observers. For this reason, we prefer that publications not identify the precise locations of vulnerable species. We suggest describing the location only to the nearest section. If this is not acceptable for your purposes, please call and discuss this issue with the Environmental Review Specialist for the Heritage and Nongame Research Program at 651/296-7863.

Revised 11/2000

Record of Communication

☑ TELEPHONE CONVERSATION
☑ Incoming
☑ Outgoing
☑ MEETING AT BLACKDUCK FORESTRY STATION

DATE: June 28, 2002
TIME: 0830
RECORDED BY: Jason Husveth
PROJECT NO.: G1153.01

SUBJECT: FHA-Biological Assessment

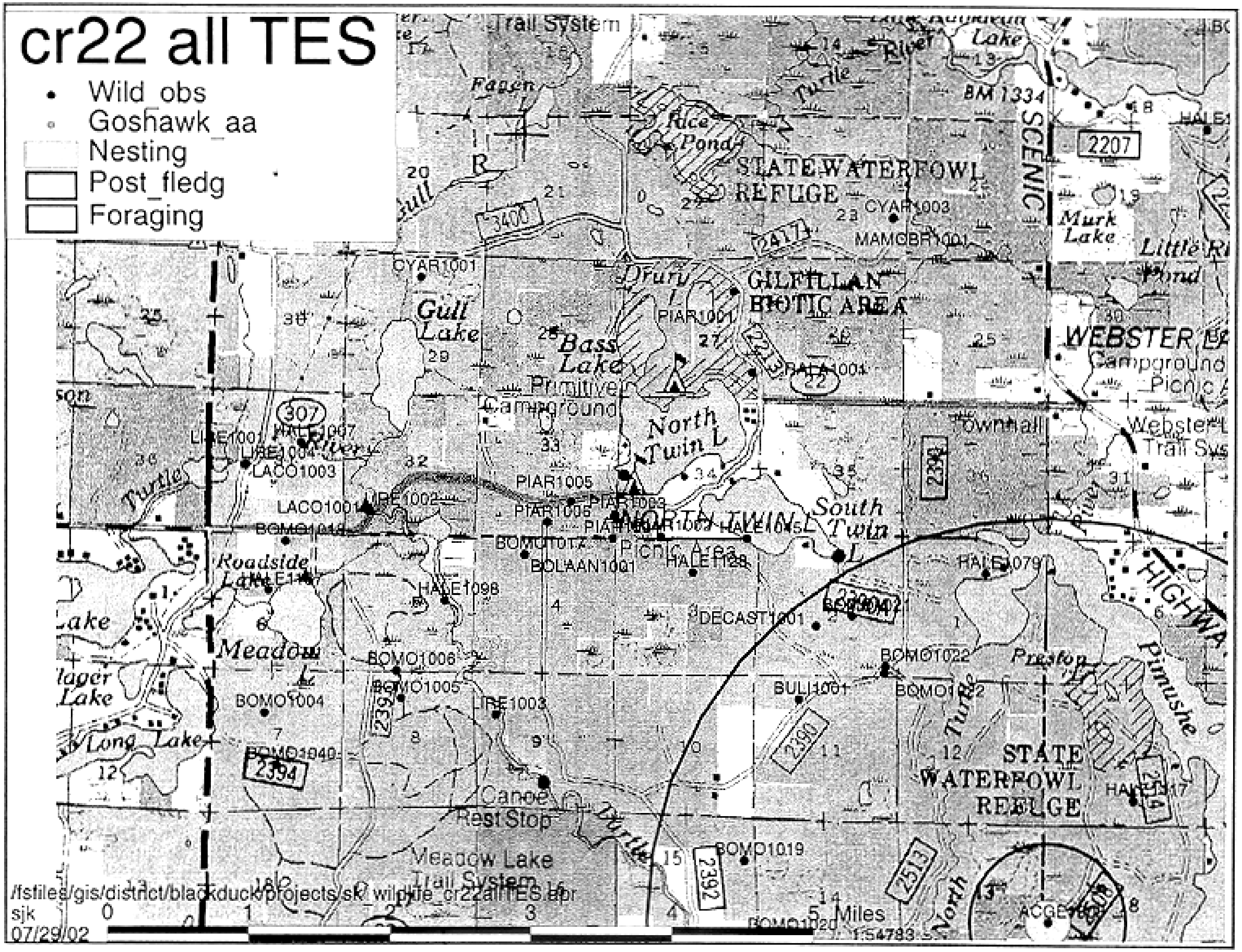
PARTICIPANTS (*Denotes part-time attendance)	ORGANIZATION	TELEPHONE/ext.
Stan Kot	US Forest Service	(218) 835-3119
Jason Husveth	TT EMI	952.736.2770 ext. 22
Sean Flannery	TT EMI	952.736.2770 ext. 14

SUMMARY:

Jason Husveth, Senior Ecologist, and Sean Flannery, Environmental Scientist with Tetra Tech EM Inc. met with Stan Kot, Wildlife Biologist with the Blackduck Ranger District Headquarters of the U.S Forestry Service. The TTEMI field investigators scheduled the meeting for the second day of the field surveys, to review the results of their first day of field surveys with the Mr. Kot and discuss any unforeseen issues that may have arisen from the previous day's site visit. The only related concern of Mr. Kot's was the large populations of showy lady's slipper orchids (*Cypripedium reginae*) that grow along the edge of the existing right-of-way within the proposed constructions limits. Mr. Kot conveyed that the local residents along Highway 22 were very concerned about provisions for the their protection and relocation. Mr. Husveth stated that these plants were not listed as Threatened or Endangered, and are therefore not protected under Minnesota's endangered species legislation (Minnesota Rules, Parts 6212.1800 and 6212.2300) or federal Endangered Species Act. However, Mr. Husveth did assure Mr. Kot that he would convey this information to the Federal Highway Administration. No additional sensitive species were recommended for surveys by the wildlife biologist. Mr. Kot expressed interest in receiving the results of our surveys and biological assessment of the proposed Highway 22 project. The meeting was approximately 30 minutes in duration.

ACTION ITEMS	*DUE DATE*
Send results of biological assessment to Mr. Kot	Upon Report Completion

DISTRIBUTION: ☑ PARTICIPANTS ☑ OTHER ☑ FILE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Wild_obs
Goshawk_aa
Nesting
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Foraging
Trail System
Rice Pond
STATE WATERFOWL REFUGE
SCENIC
2207
Murk Lake
3400
2417
CYAR1003
MAMOBR1001
CYAR1001
Drury L
GILFILLAN BIOTIC AREA
Gull Lake
Bass Lake
PIAR1001
RALA1001
22
WEBSTER L
Campground
Primitive Campground
307
North Twin L
Townhall
Turtle River
PIAR1005
South Twin L
Picnic Area
BOLAAN1001
Roadside Lake
HALE1098
DECAST1001
Meadow L
BOMO1006
BOMO1005
BOMO1004
BOMO1022
BULI1001
Long Lake
2394
LIRE1003
2390
STATE WATERFOWL REFUGE
Canoe Rest Stop
Meadow Lake Trail System
BOMO1019
2392
2513
HIGHWAY
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sjk
07/29/02
0 1 2 3 4 5 Miles
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APPENDIX B

PEDESTRIAN SURVEY PHOTOGRAPHS

Chippewa National Forest

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Existing grass right-of-way with upland northern mesic hardwood forest along proposed right-of-way edges.	1
	CLIENT	Federal Highway Administration	Date
Direction: East	PHOTOGRAPHER	Jason Husveth	6/27/02

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Tamarack swamp with red alder edge, looking north from road edge.	2
	CLIENT	Federal Highway Administration	Date
Direction: North	PHOTOGRAPHER	Jason Husveth	6/27/02

Chippewa National Forest

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Western extent of proposed right-of-way with wide herbaceous edges dominated by planted non-native grasses.	3
	CLIENT	Federal Highway Administration	Date
Direction: East	PHOTOGRAPHER	Jason Husveth	6/27/02

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Deceased mature female snapping turtle along right-of-way, with roll of flagging for scale.	4
	CLIENT	Federal Highway Administration	Date
	PHOTOGRAPHER	Jason Husveth	6/27/02

Chippewa National Forest

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Existing retaining walls along previously widened and improved section of Highway 22.	5
	CLIENT	Federal Highway Administration	Date
Direction: East/Northeast	PHOTOGRAPHER	Jason Husveth	6/27/02

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Sedge dominated wet meadow/mixed emergent marsh and small open water pool at culver inlet. Looking north, flow is from north to south through culvert.	6
	CLIENT	Federal Highway Administration	Date
Direction: North	PHOTOGRAPHER	Jason Husveth	6/27/02

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Isolated populations of the small water buttercup, *Ranunculus gmelini* were documented in small saturated pools with organic soils with northern white cedar swamps along the proposed highway right-of way.	7
	CLIENT	Federal Highway Administration	Date
Direction: East	PHOTOGRAPHER	Jason Husveth	6/29/02

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Northern white cedar swamp habitat along the edges of the proposed Highway 22 right-of-way.	8
	CLIENT	Federal Highway Administration	Date
Direction: South	PHOTOGRAPHER	Jason Husveth	6/29/02

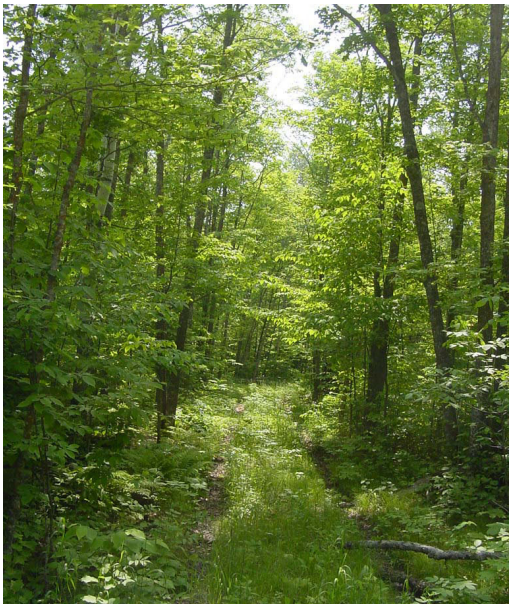
Chippewa National Forest

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Low density residential development east of North Twin Lake.	9
	CLIENT	Federal Highway Administration	Date
Direction: East/Northeast	PHOTOGRAPHER	Jason Husveth	6/29/02

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Cleared power line right-of-way along one side of Highway 22 (south), with second growth forest to the North.	10
	CLIENT	Federal Highway Administration	Date
Direction: East	PHOTOGRAPHER	Jason Husveth	6/29/02

Chippewa National Forest

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Eastern extent of proposed right-of-way, with cleared and maintained power-line right-of-way adjacent to the existing road edge to the north, and second growth woodland to the south.	11
	CLIENT	Federal Highway Administration	Date
Direction: East	PHOTOGRAPHER	Jason Husveth	6/29/02



TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Second growth northern mesic hardwood forest dominated by sugar maple and basswood, with dense Pennsylvania sedge herbaceous layer.	12
	CLIENT	Federal Highway Administration	Date
Direction: South/Southeast	PHOTOGRAPHER	Jason Husveth	6/29/02

Chippewa National Forest

TETRA TECH PROJECT NO. G1153.01	DESCRIPTION	Black spruce swamp within proposed Highway 22 right-of-way.	13
	CLIENT	Federal Highway Administration	Date
Direction: South	PHOTOGRAPHER	Jason Husveth	6/29/02